

DIGITAL ACCESS TO SCHOLARSHIP AT HARVARD
DASH.HARVARD.EDU

HARVARD LIBRARY


The Cultivation and Conceptualization of Exotic Plants in the Greek and Roman Worlds

Citation

Bertoni, Daniel Robert. 2014. The Cultivation and Conceptualization of Exotic Plants in the Greek and Roman Worlds. Doctoral dissertation, Harvard University.

Link

http://nrs.harvard.edu/urn-3:HUL.InstRepos:12269841

Terms of use

This article was downloaded from Harvard University's DASH repository, and is made available under the terms and conditions applicable to Other Posted Material (LAA), as set forth at

https://harvardwiki.atlassian.net/wiki/external/NGY5NDE4ZjgzNTc5NDQzMGIzZWZhMGFlOWI2M2EwYTg

Accessibility

https://accessibility.huit.harvard.edu/digital-accessibility-policy

Share Your Story

The Harvard community has made this article openly available.
Please share how this access benefits you. Submit a story

The Cultivation and Conceptualization of Exotic Plants in the Greek and Roman Worlds

A dissertation presented

by

Daniel Robert Bertoni

to

The Department of the Classics

in partial fulfillment of the requirements

for the degree of

Doctor of Philosophy

in the subject of

Classical Philology

Harvard University

Cambridge, Massachusetts

May 2014

© 2014 Daniel Robert Bertoni

All rights reserved.

Dissertation Advisors: Professors Mark Schiefsky and Richard Thomas Daniel Robert Bertoni

The Cultivation and Conceptualization of Exotic Plants in the Greek and Roman Worlds

Abstract

This dissertation is an investigation into how plants provide a way to explore cultural interactions between Greece and Rome and the east. I use India, a region that remained consistently exotic to most Greeks and Romans throughout antiquity, as a test case to examine how eastern plants were received and integrated into Greek and Roman culture. Throughout I use my test case as a focus and as an object of comparison: India is a constant reminder of what was conceptualized as exotic. My methodology is primarily "plants in text," an approach that incorporates both the physical reality of plants for sale at the market as well as the imagined flora that grows at the end of the earth. The results of this inquiry show the value of investigating the cultural importance of plants and the mental constructs that surround them in the ancient Greek and Roman worlds.

These exotic plants are used both physically and mentally by the receiving culture: they are consumed as luxury goods or medicines, they are abstracted into symbols as part of ethnographic theories of place and people in Herodotus and the Alexander historians, they are integrated and explained in the systematic botany and pharmacology of Theophrastus and Dioscorides, and they are transformed into symbols of power in the royal gardens of the Seleucids or of decadence in the writings of Roman satirists. The receptions these exotic plants had in Mediterranean civilizations show in depth the different ways Greeks and Romans

reacted to increased trade and contact after Alexander's conquests and reflect the cognitive geographies they created to understand their new wider world. Most importantly, they show how plants provide a way of examining the ways in which many aspects of culture—history, ethnography, science, imperialism, consumption—are intertwined and arise from the same roots.

Table of Contents

Abstract iii

Acknowledgements vii

1 Plants and Place 1
1.1 Plants in text 2
1.2 Where and what is India? 7
1.3 Beliefs and theories about plants 10
1.4 Literature on Greece, Rome, and India 15

2 The Ethnography of Eastern Plants 21
2.1 Plants as cultural objects 24
2.1.1 Plants and the golden age 28
2.1.2 Theories of cultural development 35
2.1.3 Theories of human development 42
2.2 Hellenistic Indography 49
2.3 Later traditions 56
2.4 Conclusion 62

3 Gardens of Empire 65
3.1 Changes in the Greek garden 66
3.2 Mesopotamian and Persian gardens 69
3.3 Exotic plants in the Seleucid Empire 80
3.4 Case studies 86
3.4.1 Harpalus and ivy 86
3.4.2 *Laudes Italiae* in Virgil and others 93
3.4.3 Other imperial gardens 100
3.4.3.1 Indian kingship and Aśoka 100
3.4.3.2 European botanical gardens 103
3.5 Conclusion 105

4 Exotic Plants in Theophrastus' Botanical Works 107
4.1 The basis of botany 108
4.1.1 Aristotle 110
4.1.2 Theophrastus and plant teleology 114
4.2 An influx of information 122
4.2.1 Date and composition 124
4.2.2 The context of *Historia plantarum* book 4 130
4.2.3 Egypt and India in *HP* 4 134
4.2.3.1 Plant names 134
4.2.3.2 Plants as examples 140
4.2.3.3 Scientific questioning 141
4.3 Revisions and additions 143
4.4 Conclusion 148

5 Plants for the Medicine Box and Dining Table **150**
5.1 Three exotic plants 151
5.1.1 Rice 152
5.1.2 Plums, peaches, and apricots 155
5.1.3 Pepper 159
5.2 The first century CE 168
5.2.1 India for sale 171
5.2.2 Luxury and imagined geography 177
5.2.3 Another look at pepper 182
5.3 Conclusion 185

6 Conclusions **187**
6.1 The test case of India 188
6.2 The power of plants 191

Bibliography **192**

Acknowledgements

In writing this dissertation, I have benefited from numerous colleagues and advisors, and their assistance has helped me at all stages of the writing process, from assisting in the formation of nebulous chapters to correcting typos. For their direction and suggestions throughout the process, I thank my advisors, Mark Schiefsky and Richard Thomas, who stuck with me through Theophrastus and Megasthenes. For additional encouragement and enthusiasm, I am grateful to Emma Dench, whose interest in my topic helped me to believe in my own work. Thanks also to Parimal Patil, who often knew better than I did what I was trying to say.

I thank the organizers of workshops where I benefited from the opportunity to present my work in an unfinished state: to Tom Keeline and Philip Pratt for the Dissertation Writers' Workshop and to Lizzy Mitchell and Monica Park for the interdisciplinary workshop Discovery of the Classical World. Thanks to Toby and Juno for their support during the final editing and proofreading process.

Finally, thanks to Colleen for her patience, kindness, and support.

1 Plants and Place

τὰ μὲν οὖν χωρία καὶ τὰ δένδρα οὐδέν μ' ἐθέλει διδάσκειν,
οἱ δ' ἐν τῷ ἄστει ἄνθρωποι.

Places in the country and trees can't teach me anything,
but people in the city can.

So says Socrates near the beginning of Plato's *Phaedrus* (230d). The statement can be read as ironic, since Phaedrus and Socrates have left the city to have their discussion among the trees in the countryside, but its content has at least a semblance of truth for scholars of humanities: it is from *humans* that we learn, not from inanimate objects.[1] The many subfields that are included within 21st-century classical studies investigate, for the most part, people and their monuments, whether material (architecture, art) or intellectual (literature, philosophy). As Socrates says, plants and the natural world seem to have little place in the study of Greece and Rome. I will risk an *elenchus* by taking the opposite position. What I hope to achieve is to demonstrate the value of a plant-centered study for understanding aspects of culture in Greece and Rome. This approach has some affinity to actor network theory, which advocates viewing all interactions, including those between people and objects, as relationships between independent actors whose individual agency must be considered.[2] When Hitchings applied this theory to the relationships between home gardeners in London and their plants, what emerged was a twofold viewpoint: the gardeners use plants to achieve certain societally conditioned aesthetic ends, using plants almost as paint on a garden canvas, whereas the plants' own internal motivations for a proper growing environment and sunlight bring out a

[1] I use the word "inanimate" here in a modern sense and with a slightly polemical tone. The attribution of souls to plants was common among ancient philosophical systems, as I will discuss below.

[2] See Mansvelt 2005 117-123.

more nurturing and engaged side of the gardeners, who view the plants almost as pets.[3] When we turn to the ancient Mediterranean, we see that there as well plants and the interactions people have with them are useful ways of looking at cultural issues.

1.1 Plants in text

Plants can tell us many things about a culture. True, modern classicists, with the exception of certain archaeologists and students of palynology, cannot learn directly from long-dead ancient flora. Instead they can learn from the ways human beings interacted with plants as reflected in their monuments. "Plants in text" can then be seen as a valid and useful way of understanding. Plants tell us about food, about trade and transportation, and about understanding and conceptualizing of the natural world. The Homeric poems and subsequent poetic literature, especially Virgil's *Georgics*, distinguish and describe a wide range of plants. Furthermore, Socrates' statement about not learning from plants was not one shared among all Greek intellectuals. Plato himself attempts at times to understand plants, notably in the *Timaeus*. Aristotle and his student Theophrastus also made serious efforts to learn from the natural world, and Theophrastus' botanical works are masterpieces of the science. Roman-era scholars and writers, including Pliny the Elder and Dioscorides the pharmacologist develop and systematize ideas about plants. In other arenas as well, plants' importance can be seen. It is hard to overestimate the importance of plants and vegetal imagery in the texts and visual language of the Augustan period, as Zanker has shown. In his analysis of Augustan

[3] Hitchings 2003.

iconography, plants were first symbols of Antony's decadence and later were used in Augustan golden age propaganda.[4]

Plants, then, are a worthwhile object of study in their own right and also insofar as they were themselves objects of others' study. In this project, my interest in plants is in their transportation, both as physical and intellectual objects, from faraway lands to the Mediterranean. Modern modes of travel have made the world a smaller place: this statement is trite because it is true. Americans can go to a grocery store and purchase apples from Chile or Washington, cut roses from Ecuador, and noodles from Italy or Japan. In contrast, travel and trade in the ancient Mediterranean world was not speedy enough to make these luxuries possible for Greeks and Romans. Yet this is not to say that their world was small and static.[5] As the centuries passed and the geographical reach of their civilizations extended ever further, Greeks and Romans became more aware of the lands beyond the Mediterranean, and of the plants and products that came from them. And as this process took place, new lands and peoples entered Greek and Roman consciousness, and new information needed to be adapted to existing paradigms, or new paradigms needed to be created.

Plants make a suitable medium to study this flow of information and ideas for several reasons. First, in the ancient world the connection people had with plants and the natural world was much closer than the one we have today. Much of day-to-day life took place outdoors: exercise in the gymnasium, festival sacrifices, theater and spectacle, and even

[4] See esp. Zanker 1990 57-65 on Antony, 89-98 on the use of acorns and the *corona civica*, and 177 in particular on the golden age as represented in the "Pax" relief on the Ara Pacis. Elsner 1991 57-59 gives a slightly different picture by emphasizing the sacrificial nature of the Ara Pacis, especially the garlands and bucephali: Augustan prosperity is undergirded by death.

[5] See Morley 2007 7ff. for the extent of ancient trade.

education.[6] Because of this, average people simply had more contact with plants in an average day, and this made plants occupy comparatively more of their mental space.

Second, plants are rooted to their native land. For Aristotle and other scientists, a defining feature of plants is their immobility, as I will discuss below and in chapter 4. This fixedness can have a symbolic nature, based on the plants' having a closer connection to the land than other possible symbols: animals migrate or can be transported and reproduce in foreign lands, craft goods and the products of technology can be traded across borders. Plants (especially as Greek science understood them) are closely adapted to the very soil under them and the environment in which they grow. They are thus an obvious symbol or emblem of a land or country. Consider for instance the use of silphium on the coinage of Cyrene and wild celery (*selinon*) on the coins of Selinous, among others.[7] As modern examples, consider the connotations that might accompany coconut palm (sun, sand, and getting away from it all), or mistletoe (snow, sleighs, and maybe Santa Claus). Also, plants' very connectedness to the earth makes them easy subjects for discussions of exoticism and of domestication. In a given region of the world some plants grow and flourish *sua sponte*, some require the tending of a gardener, and some will not grow at all. In another region, the plants that fall into these categories may be quite different. These facts were realized by scientist and farmer alike, and from them we can see how a basic cognitive geography can be founded on an understanding of flora.

[6] To return to my opening quotation, consider Socrates and Phaedrus relaxing underneath the plane tree (πλάτανος) outside of Athens. The other plant Socrates mentions (ἄγνος; chaste tree) is mistranslated "willow" in Fowler's Loeb. This is unfortunate, as willows generally flower very early in the year (before the plane would be in leaf), and their catkins are not particularly fragrant (Socrates calls the place εὐωδέστατος).

[7] See Andrews 1963.

Third, and perhaps most importantly for the purposes of this study, plants are only one of many examples of contact between the Mediterranean world and the east. By concentrating my study on plants, I am able to expose a cross section of the complex, layered interactions between the Mediterranean and the outside world, to explore many kinds of relationships without becoming overwhelmed by the massive amount of intercultural transfer and exchange. From this we can come to terms with a Greek and Roman world that is progressively more aware and more interested in understanding, adapting, and using foreign flora.

As I trace and analyze the importance of foreign flora in the Greek and Roman worlds, I have chosen to focus on India in particular. India was eternally foreign in the Greek and Roman worldviews. It entered Greek mental space in an early period, but never came under control of Hellenistic or Roman powers, always existing on the imagined edge of the Greek and Roman worlds. It was a place tantalizing in its foreignness and in its remaining always out of the grasp of conquerors. It was an area that contained many exotic peoples and civilizations as well as exotic plants, and Greeks and Romans often reacted to plants and people in similar ways. Additionally, the civilizations that developed in India are themselves of great antiquity, and they developed their own views, beliefs, and theories about plants and their relationships with humans. Comparing these beliefs with those of Greeks and Romans can occasionally shed light on particular aspects of western thought. For these reasons, throughout this project India will frequently serve as a test case for interactions with exotic plants and the attitudes and cultural beliefs that accompany them and as a useful comparison for cultural processes in the Mediterranean worlds. This is not to imply that I have nothing to say about plants from other exotic locales. Indeed, part of my fourth chapter is a comparison between Egyptian and

Indian flora, to examine how their treatment in Theophrastus' botanical works reflects the different statuses of the two places: one being the center of a Greco-Macedonian Empire and the other lying beyond even the easternmost border of Seleucid control.

My study of plants through text does not neglect the physical presence that some Indian plants had in the Mediterranean world as consumables and luxury goods, but I am more interested in how they appear in various conceptions about India and the east. These ideas range from notions of a utopia at the edge of the earth to characterizations (of varying accuracy and thoroughness) of people and places. These views informed history, science, and *belles lettres*. By seeing how plants fit into this intellectual framework, I explore larger issues of boundaries, human culture, scientific development, and responses to external pressures. To achieve this, I highlight here three major aspects of exotic plants as they appear in Greek and Roman texts: theoretical, scientific, and symbolic. These aspects will be relevant to various degrees in the chapters that follow.

In chapter 2 I discuss plants in ethnographic writings, which make use of plants in theories, with some addition of plant symbolism. I focus particularly on flora in Greek and Roman writings about India: how they developed over time and how theories about human culture are apparent in descriptions of exotic plants. Chapter 3 is a study of one of the most potent uses of plants as symbols: to represent hegemony and imperial control over space. In this chapter, my focus is on Near Eastern empires, the Seleucid Empire, and Rome, but India provides useful comparative information from the use of plants by the emperor Aśoka. In chapter 4, I turn to the place of exotic plants in Theophrastus' botanical writings, which draw on theoretical and scientific aspects of plants, including the bases of botany that he developed from Aristotle's biological work. This chapter also includes a comparison of Theophrastus'

accounts of the plants of Egypt and India, by which I demonstrate his process of incorporating new information into his botanical treatises. Chapter 5 is devoted to Indian plants as objects of consumption in Greece and Rome: how they entered the western world as trade goods, and the mental geographies of India that were created to accompany them. My analysis here involves both the diachronic question of how these plants became known and used as well as the synchronic question of their place in the culture of the 1st century CE. In all of these chapters, it is clear that exotic plants meant many things. They could express concepts of culture and human development, they could symbolize control over space, they could be an exotic (or naturalized) ingredient in medicine, and they could serve as markers of luxury or decadence. And, throughout, my test case of India serves as the locus of the exotic *par excellence* and provides both a focus and a comparative perspective, both an imagined geography in the minds of Greeks and Romans and a source of real goods for sale.

To round out this introductory chapter, I will first explain what I mean by "India," as I use the term in different contexts and with somewhat different meanings. I will then perform a brief survey of various ancient scientific and philosophical beliefs and theories concerning plants, which will form a useful background to the subsequent chapters. Finally, because of the importance of India to this project, I will give a survey of ways modern scholars have tried to understand the relationships between the Greek and Roman worlds and India.

1.2 Where and what is India?

I use the words "India" and "Indian" frequently in the following pages, and a brief note on what these words mean would be useful. My perspective is usually from the Mediterranean looking east, and my viewpoint overlaps with that of a Greek or Roman of the relevant time

period. Thus, these terms have shifting meanings, and in accordance with this I will use the term "India" rather freely. At times its precise geographical denotation would be hard to trace on a map, but this is not a fatal flaw, since I am more interested in the mental geographies conjured up by the name. At different time periods different physical regions would have had that appellation, but fundamental concepts and conceits about what "India" meant were long-lasting. In 480 BCE, "India" would refer to the land around the Indus River, in modern Pakistan, where Skylax had explored at the behest of Darius I (*BNJ* 709) and whence various soldiers in the Persian army originated (Herodotus 7.65). The subcontinent was yet unknown. Two centuries later, Onesicritus uses the same name to refer to a place he actually visited, whose most southerly part was the Land of Musicanus, near the mouth of the Indus (Onesicritus *BNJ* 134 F 22 = Strabo 15.1.21-22; *BNJ* 134 F 24 = Strabo 15.1.34). Yet in Megasthenes' *Indica*, which was based on the experiences of the author as an ambassador in Chandragupta Maurya's court, the toponym is applied to the whole northern stretch of the subcontinent, at least as far east as Pataliputra (Παλίμβοθρα; modern Patna) on the Ganges (*BNJ* 715 T 2c = Strabo 2.1.9), and its southern coasts as well are known (*BNJ* 715 F 4 = Diodorus 2.35.2). Despite this stretching of the area called India, it remained the same place in the Greek worldview.[8] Eratosthenes too knew India as the subcontinent. The rapid development of the term is clearly apparent. Before Megasthenes, the name is used exclusively for the Indus Valley. Afterward, "India" refers to the entire subcontinent, including the Indus and Ganges, from the Hindu Kush in the northwest and the Himalayas in the northeast to the southernmost tip. Thus, in a space of about a century (ca. 350 - 250 BCE), the name "India" grew to encompass a far greater physical area, with far more peoples, places, and plants to feed the

[8] See Parker 2008 43-44.

imaginations of Greeks and, later, Romans. By Roman times, India was more accessible than ever due to heightened maritime trading. The itineraries in the *Periplus of the Red Sea* give a more or less accurate rendition of the geography of the west coast of the subcontinent, but the sort of contact described in this text does not have great literary aspirations. The result of this is what Parker calls "confused mapping" in Ptolemy:[9] the Indus valley, with its connection to Alexander, was always known as "India," but same name was also applied to the ports of the southern subcontinent, which were visited by many trading ships. In Parker's view, these ports never held the same place in the Roman geographical imagination. What is surprising, though, is how little the Greek or Roman imagination changed, despite an increased flow of trade goods and information, and even despite Alexander's advances. As its plants reveal, in many ways, no matter how far east and south its boundaries were pushed, "India" maintained its former connotation of lying at the edge of the earth.

In accordance with the Greek and Latin uses of the place name "India" to refer to different geographical spaces but only one conceptual space, I will translate the adjectives used to refer to things from India (Ἰνδός or Ἰνδικός or *Indus* or *Indicus*) as "Indian," rather than transliterating them; I will say "the Indians do X," instead of "the Indikoi do X." Some modern scholars hesitate to use a label such as "Indian" that has a modern geopolitical meaning, but are comfortable using "Greek" (without the omnipresent prefix "Ancient") to refer to a Mediterranean culture whose boundaries go beyond the current political boundaries of the nation of Greece and whose culture does not map onto what is nowadays called "Greek." In this sense, the word "India" will be used as a result of its use by ancient Greek and Roman authors. And the imprecision of this denizen label is not a fault, due to its imprecise use in the

[9] Parker 2008 189-191.

original languages. That being said, I do not wish to create problems by conflating different uses of the term over time. I have done my best to be conscious of the time period in question when I use the term to avoid anachronism.

To briefly glimpse the other side of the exchange: when I refer (in footnotes and elsewhere) to texts from India, often written in Sanskrit, care must be taken to remember that each text represents a particular tradition, and that there is no unitary "Indian" viewpoint that can be juxtaposed with a "Greek" or "Roman" one.[10] The use of Sanskrit as a language of culture and politics was often shared between very different groups,[11] but not all of India is represented in Sanskrit texts, and I will make some references to texts in Prakrit and Tamil as well.

1.3 Beliefs and theories about plants

Plants played many parts in the Greek and Roman worlds, from sources of food and clothing to luxury goods and fertilizer. A survey of the appearances of plants in texts will provide a useful background for the coming chapters. One of the earliest Greek poems, Hesiod's *Works and Days*, centers on methods of agriculture, and this type of practical knowledge was well-treated by other writers from Xenophon and Theophrastus to Cato, Varro, Virgil, and Columella. In his *Oeconomicus*, Xenophon presents the *technê* of agriculture as simple and straightforward. Ischomachus considers that the theories of agricultural writers are unnecessary for determining the φύσις τῆς γῆς (16.1-6) and believes that knowledge about how to farm is innate: differences in results are not due to lack of knowledge but to faults of

[10] See Minkowski 2010 22-23 on the dangers of equating "Sanskritic" and "Indic."

[11] See Pollock 2006.

character (20.2-16).[12] In his view, every Athenian can be a successful farmer. This attitude changed by the Roman period with the increased number of vast, slave-run plantations, leading Columella to lament the fact that no one knew how to farm any more (1.praef.7). And beyond the circumstances of their production, plant products were part of the diet of every Greek and Roman, from bread to olive oil to wine. In both of these contexts—growing and eating—theories were generated as to how plants grow, what plants themselves feed on, and how plants interact with the human body. It is in this framework that we begin to see inquiry into what plants truly are: almost a Socratic question, φύτον· τί ποτ' ἐστίν?

Philosophers and *phusikoi* made judgments about various aspects of plant life. Empedocles compared human features to those of plants.[13] Other Presocratics discussed to what extent they could be considered alive, as is summarized in the doxography at the opening of ps.-Aristotle's *De plantis* (815a10-815b34).[14] The author of this treatise reports that Anaxagoras and Empedocles attributed sensation (*sentire*) and desire (*desiderio moveri*) to plants (815a14-16), and that Anaxagoras, Democritus, and Empedocles believed they had intelligence (*intellectum intelligentiamque*; 815b15-16). Philosophers were often concerned with the kind of life plants live: do they have souls? According to Plato, plants share in the appetitive part of the soul, and thus have life and can be called ζῷα (*Timaeus* 77b). The author of the *Epinomis*

[12] The process by which knowledge about farming is to be accessed is Socratic recollection, though the technical term ἀνάμνησις is not used. This is demonstrated by the form of Ischomachus' conversation with Socrates, particularly when Socrates remarks, after Ischomachus draws out knowledge about sowing: ἄγε δή.... οἶδα, ὦ Ἰσχόμαχε· τὰ μὲν δὴ ἀμφὶ σπόρον ἐπιστάμενος ἄρα ἐλελήθειν ἐμαυτὸν ἐπιστάμενος (OK then.... I understand, Ischomachus. Though I knew about sowing, I had forgotten my own knowledge; 18.10).

[13] For this he is called "the first Greek biologist" by Lonie 1981 214.

[14] This text is now attributed to Nicolaus of Damascus. The Greek version of this text (as printed by Bekker and by Hett in his 1936 Loeb edition) is a translation of a Latin version, which itself was made by Alfred of Sarashel in ca. 1200 from an Arabic translation (Drossaart Lulofs and Poortman 1989 9-14; 563). The work itself is a compilation from Aristotle's lost *De plantis* and from Theophrastus' botanical works (Drossaart Lulofs and Poortman 1989 1, with stemma on opposite page).

agrees that plants are living things, classifying them as based on the earthy element and calling them stationary and fixed in place by their roots (μόνιμα, διειλημμένα ῥίζαις; 981d). Aristotle states that life (τὸ ζῆν) is common even to plants: τὸ μὲν γὰρ ζῆν κοινὸν εἶναι φαίνεται καὶ τοῖς φυτοῖς (*EN* 1097b33), but assigns to plants only the lowest class of soul, the nutritive: that in virtue of which anything is alive (*De anima* 415a14-416b31). Despite the etymological connection, Aristotle disagrees with Plato and believes that plants cannot properly be called ζῷα, as they do not have sensation and do not move (*De anima* 413b1-5). For him, plants have life, but no consciousness or rationality.[15] Plants are not animals, but they are animate. Finally, Theophrastus believes that plants have souls, or at least that they are a separate category from τὰ ἄψυχα (*Metaphysics* 10b20).[16] Some of these beliefs can be paralleled in Indian traditions. Though there is not a clear consensus there, generally plants are classified as having life, and possibly even sentience, based on various qualities that they possess, including sap, the properties of breath and growth, and sometimes an apparent sense of touch.[17] Buddhists as well, at least in the earliest period, viewed plants as living, sentient beings, taking that belief over from Vedic and Jain predecessors.[18]

With plants firmly established as living things, the question of their point or purpose, their τέλος, comes to the fore. Plato's view in the *Timaeus* is that plants are destined to provide food for humans, and he states that the gods planted them for that purpose: ταῦτα δὴ τὰ γένη πάντα φυτεύσαντες οἱ κρείττους τοῖς ἥττοσιν ἡμῖν τροφήν ... (by planting all of these varieties

[15] In the *Metaphysics*, he takes advantage of plants' lack of reason in stating that arguing with an opponent who does not proffer a response is no better than arguing with a plant, since both lack λόγος: γελοῖον τὸ ζητεῖν λόγον πρὸς τὸν μηθενὸς ἔχοντα λόγον, ᾗ μὴ ἔχει· ὅμοιος γὰρ φυτῷ ὁ τοιοῦτος ᾗ τοιοῦτος ἤδη (1006a14-15).

[16] The textual problems at this point of the text are of no concern in this matter.

[17] Findly 2008 83-97; 111ff.

[18] Schmitthausen 1991 3-4.

[of plants], as nourishment for us inferior ones, the superior gods ... 77c). In contrast to plants, animals (as well as women), are produced by successive reincarnations of degenerate men (90e-92c) and thus do not serve primarily to provide food.[19] Saying that plants are the gift of the gods for food clearly establishes their place in relation to humans, but where does agriculture fit? Slightly earlier in the *Timaeus*, when Plato describes the mechanism of the creation of plants, there seems to be more scope for human industry:

> τῆς γὰρ ἀνθρωπίνης συγγενῆ φύσεως φύσιν ἄλλαις ἰδέαις καὶ αἰσθήσεσιν κεραννύντες, ὥσθ᾽ ἕτερον ζῷον εἶναι, φυτεύουσιν· ἃ δὴ νῦν ἥμερα δένδρα καὶ φυτὰ καὶ σπέρματα παιδευθέντα ὑπὸ γεωργίας τιθασῶς πρὸς ἡμᾶς ἔσχεν, πρὶν δὲ ἦν μόνα τὰ τῶν ἀγρίων γένη, πρεσβύτερα τῶν ἡμέρων ὄντα. (77a-b)
>
> [The gods] mixed a nature akin to human nature with other forms and perceptions, so that it was a different living thing, and planted it. The presently cultivated trees and plants and seeds have been trained by agriculture and made to suit our needs. At an earlier point there were only classes of wild plants, as these are older than the cultivated ones.

Here plants have been made to suit our needs, τιθασὰ πρὸς ἡμᾶς, by agriculture, γεωργία. The picture here is nuanced: the gods created plants, but human effort was required for bringing the plants under cultivation and allowing them to reach their potential as nourishment for humans.[20] Aristotle's work on plants has been lost—the *De plantis* found in the Corpus Aristotelicum is now attributed to Nicolaus of Damascus—but we can see a somewhat Aristotelian approach to plants through the work of his student Theophrastus, as I will discuss

[19] There are clear Near Eastern parallels to Plato's creation story, as evidenced by the corresponding account in the book of Genesis:

> καὶ εἶπεν ὁ θεός ἰδοὺ δέδωκα ὑμῖν πᾶν χόρτον σπόριμον σπεῖρον σπέρμα ὅ ἐστιν ἐπάνω πάσης τῆς γῆς καὶ πᾶν ξύλον ὃ ἔχει ἐν ἑαυτῷ καρπὸν σπέρματος σπορίμου ὑμῖν ἔσται εἰς βρῶσιν. καὶ πᾶσι τοῖς θηρίοις τῆς γῆς καὶ πᾶσι τοῖς πετεινοῖς τοῦ οὐρανοῦ καὶ παντὶ ἑρπετῷ τῷ ἕρποντι ἐπὶ τῆς γῆς ὃ ἔχει ἐν ἑαυτῷ ψυχὴν ζωῆς πάντα χόρτον χλωρὸν εἰς βρῶσιν καὶ ἐγένετο οὕτως. (LXX Genesis 1:29-30)
>
> And God said: "Behold, I have given to you every sowable seed-bearing plant that exists over the entire earth, and every tree that has fruit in it with sowable seed, for you to have for food. And to all the beasts of the earth and to all the birds of the sky and to every creeping thing creeping upon the earth which has in it the breath of life [I have given] every green plant for food," and it was so.

[20] I discuss further the place of plants in the development of human civilization in chapter 2.

in more depth in chapters 2-4.[21] For now, it is enough to say that he attempted to fit plants into a modified Aristotelian intellectual framework by describing and classifying them, determining how they work (their δυνάμεις, in effect), and by figuring out what the τέλος (or τέλη) of a plant's life is. Some of his results differed sharply from Aristotle's, as I will show in chapter 4.

Plants were also important for those who researched topics other than philosophy. This is clearly visible in medical writers, who frequently discuss issues of diet and give recommendations on which foods to eat and which to avoid. These kinds of recommendations are found in several texts from the Hippocratic corpus, among other medical writings, alongside recipes for various medicines that often include plants or plant products as ingredients. In the medical writers, the issue at stake is not the plant itself, but rather the interaction between plants and humans on a physiological level: how eating barley gruel can help a patient suffering from fever, how drinking wine is often healthier than drinking water, or how a medicine containing black hellebore will purge the body of corrupted humors. In fact, the author of the Hippocratic *De vetere medicina* traces the history of medicine to an interest in the proper preparation of plants to make them suit human digestion:

> οὗτοί μοι δοκέουσι ζητῆσαι τροφὴν ἁρμόζουσαν τῇ φύσει, καὶ εὑρεῖν ταύτην, ἣ νῦν χρεόμεθα· ἐκ μὲν οὖν τῶν πυρῶν, βρέξαντες καὶ πτίσαντες καὶ καταλέσαντες πάντα, καὶ διασήσαντες, καὶ φορύξαντες, καὶ ὀπτήσαντες, ἀπετέλεσαν ἄρτον· ἐκ δέ γε τῶν κριθέων μᾶζαν, ἄλλα τε συχνὰ περὶ ταύτην πρηγματευσάμενοι, ἥψασάν τε καὶ ὤπτησαν, καὶ ἔμιξαν, καὶ ἐκέρασαν τὰ ἰσχυρά τε καὶ ἄκρητα τοῖσιν ἀσθενεστέροισι, πλάσσοντες πάντα πρὸς τὴν τοῦ ἀνθρώπου φύσιν τε καὶ δύναμιν. (§3; I.576-578 Li.)
>
> I believe that these [ancients] sought for a source of nourishment that matched their nature and found one that we still use today. They soaked wheat, winnowed it, and

[21] Most of Aristotle's discussions of plants come in the form of contrasts to animals in his biological works. In these circumstances, plants are often singled out for what they *cannot* do. There is a solitary reference to the function of plants at *Politics* 1256b15-16: οἰητέον τά τε φυτὰ τῶν ζῴων ἕνεκεν εἶναι καὶ τὰ ἄλλα ζῷα τῶν ἀνθρώπων χάριν (We should think that plants exist for the sake of animals and the other animals are for the sake of humans). See chapter 4 and Sprague 1991 229.

> ground it up, then sifted it, mixed it, baked it, and formed bread. From barley they formed cakes, after making numerous other attempts: they roasted it and baked it, and combined the stronger and unmixed elements with the weaker, doing all this as to suit human nature and ability.

This concern with the relationship between plants as food and medicine and human health is a common theme in medical writers throughout antiquity. In chapters 4 and 5 I examine how new, exotic plants were made to fit scientific and medical paradigms.

On another level are those authors who write about plants as symbols. This category comprises ethnographers and historians who describe a place or a people through its flora, as well as satirists who mock the use of pepper and incense. Here again the individual plant *qua* plant is not the main target of discussion, but rather the connotations and valences that surround it: where it is native to, where it is and can be grown (often not its native land), what it is used for, how much it costs. In the *Georgics* Virgil can express themes of the new Augustan age through plant symbolism in the *laudes Italiae*, juxtaposing exotic ebony (2.115-116) and banyan (2.122) with the native plants of Italy. In the *Ars amatoria* Ovid can make use of the dangerous exoticism of pepper by recommending against it as an aphrodisiac: if one is needed, humbler plants such as onion and arugula will suffice (2.415-424). Pepper's exoticism is used to different effect by satirists, who often use it as a marker of excess at the dinner table, such as in Horace's descriptions in his *Satires* of Catius' gourmet advice (2.4.74) and of Nasidienius' feast (2.8.49). In each of these authors, plants serve as a medium to allow the raising of larger issues about culture, hegemony, luxury, and decadence.

1.4 Literature on Greece, Rome, and India

Modern western scholarship on the relationships between ancient India and the Mediterranean civilizations of Greece and Rome began during the period of British colonial

rule in India, and the Raj looms large over these early works. Some of these were written by British scholars who lived in India, such as a 1901 collection of Greek and Roman texts pertaining to India by J.W. McCrindle, the former principal of Government College in Patna (ancient Pataliputra), and a 1916 synthesis of contact between India and the "western world" by H.G. Rawlinson, a professor at Deccan College (in Pune in the modern state of Maharashtra). These works are often colored by a colonial mindset that views India as a space for western exploitation. Such attitudes are also present in E.H. Warmington's 1928 monograph on the trade between India and Rome, a meticulous work that has only recently been superseded by Tomber's 2008 *Indo-Roman Trade* due to new archaeological discoveries in Egypt and southern India. Warmington maintains a colonial viewpoint about the capacities of westerners and easterners, which leads to an account of vigorous Greeks and Romans discovering the complacent east.[22] For instance, he states about the discovery of the monsoon trade between Egypt and India:

> It was typical of the western and of the eastern mind that the possession of a boon like the monsoons sent Greeks pouring over the seas to India, but did not stir up Indians to come westwards with equal energy. (66)

This attitude is pervasive in early scholars, and it reaches its ugliest extent (to a modern reader) in Tarn's *The Greeks in Bactria and India* (2nd edition published in 1951), where the author connects the decline of Greek hegemony in Bactria to racial degeneration, with an explicit comparison to the conditions of his time:

> I think there was another factor, apart from mixed marriages, to which a good deal of weight must be given. British children are not brought up in India to-day, not so much because they cannot be reared (though in some places they may grow up sickly) as because there is a tendency that at their impressionable period some of their native characteristics may weaken and they acquire a mentality somewhat nearer akin to that of the Indian, and not the highest type of Indian. (390-391)

[22] Especially in his introduction, pp. 1-2.

The theoretical basis for these colonial attitudes was provided by the early Hegelian-hued study of Hellenism by Droysen and his followers in the second half of the 19th and the early 20th centuries. Moyer has given an excellent overview of the history of this scholarship,[23] and I will emphasize here only the difficulty scholars had in reconciling the view of Hellenism as a synthesis between west and east with the colonial and racial attitudes of their day.

After the independence of India in 1947, scholarship on its particular relationship with Greece and Rome dried up to a considerable extent. Additionally, post-colonial trends in scholarship began to become mainstream in the academy. Now, classical scholars whose interests stretched beyond the boundaries of the traditional Mediterranean world devoted themselves to studies of identity (predominantly Greek identity) and interactions with the Other. The major landmarks of this trend were Francois Hartog's *Mirror of Herodotus*, which was published in English translation in 1988, and Edith Hall's 1989 *Inventing the Barbarian*. These studies argued that Greek identity was constructed in opposition to a barbarian Other, and that Greek texts that superficially pertained to other cultures were in fact reflections or inversions of Greek identity. These views have reigned in the academic community for over two decades, but now new approaches to identity in the ancient world have started to be developed.[24]

There is presently much excitement in the scholarly community about crossing borders and boundaries, both between disciplines and, in a more concrete sense, between different physical areas of the ancient world. It is thought that a better understanding of the Greek or Roman world can be obtained from plowing new fields and examining nearby civilizations and

[23] Moyer 2011 11-36.

[24] See Dench 2013 for a discussion of these recent developments.

their relationships with the primary objects of study, and giving a voice to cultures that had before been simply labeled as "Other." Of primary importance are studies of identity, especially involving time periods (such as the Hellenistic Period) and geographical spaces (such as Egypt) when and where people from differing backgrounds were part of the same milieu, or mixing-pot, or melting-pot, or soup-pot, or salad-dish, depending on the scholar's views and choice of metaphor.[25] Moyer's groundbreaking 2011 study on *Egypt and the Limits of Hellenism* has been followed up with theoretical work on Greek ethnography by Skinner (*The Invention of Greek Ethnography* in 2012). I will survey these developments further in chapter 2, but it is clear that a turning point has been reached in contemporary studies of foreignness in the Mediterranean cultures of Greece and Rome. In terms of this project, exotic plants can be mapped onto these ideas about exotic people, since the cultural assumptions involving each were often similar.

Indian *plants* in particular are rather less studied than India itself. Some studies from the late 19th and early 20th centuries focus on gathering information about plants and plant movement. Hehn's *Kulturpflanzen und Hausthiere in ihrem Übergang aus Asien nach Griechenland und Italien* (seventh edition published in 1902) is a massive and comprehensive study of the foreign origins of some common European plants and animals, Bretzl's 1903 *Botanische Forschungen des Alexanderzuges* is a more specific study on the development of botanical knowledge in the Alexander historians and Theophrastus, and Laufer's *Sino-Iranica*, published in 1919, has a special focus on the movement of plants across central Asia, frequently making reference to India and the Mediterranean. A unifying feature of these studies is that they are attempting to find historical facts about plants: which foreign plants exactly are discussed by

[25] The difference beneath the glibness here is in the extent to which individuality is maintained in a complex of many "ingredients."

Greek authors, where they came from, and who described them first. Additionally, these texts frequently fall into the rabbit-hole of trying to identify the plants described in Greek or Latin texts, which is difficult in the best circumstances and impossible in others.

The Loeb editions of Theophrastus' works—Hort's two-volume *Enquiry into Plants*, published between 1916 and 1926, and Einarson and Link's three-volume *De causis plantarum*, published between 1976 and 1990—also engage in some attempted identification. Hort's identifications in particular have been viewed as dubious by later scholars.[26] There is a certain inevitable futility in trying to map Theophrastus' system of plant classification onto modern Linnaean taxonomy, yet a tendency toward it is present even in authors of the present day. Suzanne Amigues's extensive (and ongoing) work on Theophrastus and ancient botany has been immensely useful for this project. As of early 2014, she has completed Budé editions of Theophrastus' *Historia plantarum* in five volumes (1986-2006) and the first volume of an edition of the *De causis plantarum* (2012). From the Indological perspective, Findly's 2006 book *Plant Lives in Indian Traditions* is invaluable for disentangling views about the nature and status of plants in Hindu, Jain, and Buddhist traditions. In the last case, she builds upon the work of Schmitthausen, whose 1991 monograph *The Problem of the Sentience of Plants in Early Buddhism* is worth reading even for those with no special interest in studies of South Asian religion.

Other modern scholarship on India occasionally touches upon plants. Sedlar's *India and the Greek World* (1980) and Halbfass's *India and Europe* (revised English translation by the author in 1988) are mostly focused on philosophico-religious contact between the cultures. Halbfass's book in particular is a nuanced comparison of both parties in the relationship, though it emphasizes India and periods later than classical Greece and Rome. Klaus Karttunen's two

[26] See Scarborough 1978.

books on India and Greece, *India in Early Greek Literature* (1989) and *India and the Hellenistic World* (1997), detail wide-ranging contacts between these cultures, with special emphasis on the Indian side, due to Karttunen's background as an Indologist. His proposed volume on Rome has not yet come out, though it may have been supplanted by Grant Parker's *Making of Roman India* (2008) which sets the standard against which new scholarship on western views of India should be judged. Karttunen and Parker both engage with India on multiple levels: as a trade partner, as a myth, and as a social-geographical construct in the minds of Greeks and Romans. In this last sense, Parker's work, which builds to a large extent off of Dihle's 1964 study of the fixity of India in the western mindset, has been successful in describing the India of the mind that existed for Romans, the conceptual geography, laden with memories of Alexander, that influenced their knowledge of the real place.

There are many more works of scholarship that I have drawn upon in writing this dissertation, but I will allow them to be cited in their proper places in the coming chapters. Overall, this dissertation will use the ideas that have been developed by the past hundred-plus years of study of exoticism and the Other, via my test case of India, to examine the place of exotic plants within scientific and cultural frameworks. The result is that looking at these plants, with a focus on India, allows us a view of Greek and Roman interactions with a world beyond imperial borders but still accessible to the geographical imagination.

2 The Ethnography of Eastern Plants

Greeks and Romans described exotic flora when they wrote about exotic peoples and places, in texts Classicists often label with the term "ethnography." This term has been used to refer to certain specific texts and portions of texts from the ancient Greek and Roman worlds, sometimes applied to entire works, such as Tacitus' *Germania*, but more often to sections of works or particular tendencies of authors, such as the description of Egypt and the Egyptians in book 2 of Herodotus' *Histories*. The term was first used in reference to classical texts in the work of Trüdinger (1918), and its use was extended in Norden's study of the *Germania*, the first edition of which was published in 1922.[1] Ethnography has been a useful label to apply, and it is now generally recognized that ethnographic works share tendencies and tropes, but do not represent a "genre" in themselves.[2] That being said, it is a major area of research to determine how this kind of writing reflects and embodies Greek and Roman ideas of identity and how intercultural contacts are encoded within it.

The current flowering of scholarship on ethnography is traceable to the 1980s, when Francois Hartog's and Edith Hall's monographs on Greeks and "Others" were published.[3] These scholars promoted the view that Greek ideas about the "barbarian" were self-conscious creations that contain more information about Greek ideas about themselves than about any

[1] For a brief overview of the early history of ethnography in classics, see Thomas 1982 1-3.

[2] For the lack of a true genre of ethnography, see Woolf 2011 13-17. One unique feature of Greek ethnography and its descendents is that it is written in prose. Skinner 2012 236-237 raises the important point that the primacy of prose should be viewed as independent of the cultural information contained within it. According to him, the use of prose as a medium is based on a specific historical situation in the Greek world and does not have special relevance for ethnographical information. The supposed reliance on empirical standards of proof (a vestige of the "Ionian revolution" of the 6th century) is also in contrast to Indian Brahmanical traditions. See Minkowski 2010 for an account of pre-modern "ethnography" in the Sanskrit Purāṇas (written in verse) and competing traditions. In the Purāṇas, there is no privileged status to knowledge arising from science versus that arising from scripture. Each represents a valid *pramāṇa* (source of knowledge); see Plofker 2010.

[3] Hartog 1988 is the English translation of his original publication; Hall 1989. See Dench 2013 for an overview of how these texts were adopted, dissected, and reacted to in the following decades.

actual intercultural contact. This idea has recently been criticized as being too stark: alterity models omit one side of the relationship.[4] Modern approaches to ancient ethnography have mostly rejected this polarity of Greek-barbarian in favor of a sliding scale between the two poles and different types and degrees of contact.[5] Yet the concept of "barbarian" did arise, and Greeks and Romans continued to write about foreign peoples in an ethnographic mode. The Greek-barbarian dichotomy is commonly thought to have crystallized sometime around the start of the Persian Wars in the early 5th century,[6] though this idea is not entirely uncontroversial.[7] More recently, scholars have emphasized the agency of the foreign peoples in creating themselves as barbarians. Moyer has displayed the importance of the Egyptians in fashioning their own "barbarian" identity,[8] and Haubold has shown the importance of Persian "imperial drama" in creating their own image.[9] Much of this work involves what Woolf calls the "middle ground," a contact zone where foreign peoples interacted with the people who would write about them, remaking myths in ways that suited the cultural and political needs of both groups.[10] Additionally, studies of ethnography in Classics often center on Herodotus

[4] See Vlassopoulos 2013b 50-55 for a concise critique of alterity models.

[5] Skinner and Vlassopoulos both challenge the traditional view, preferring to discuss the development of ethnographical knowledge as changes in quantity rather than changes in quality. See especially Skinner 2012 20-22 and 249ff. and Vlassopoulos 2013a 7-11 and 11ff., where he gives his alternative model of four "worlds" of contact: the world of networks, the Panhellenic world, the world of colonies, and the world of empires.

[6] See Hall 1989 57ff.; Skinner 2012 1ff., who gives a brief overview with references, esp. to Jacoby; and Vlassopoulos 2013a 1-4.

[7] For another view, see Kim 2013, who traces the development of the concept of a barbarian "other" to pan-Ionian sentiment and Persian grouping of the Greeks in their "administrative ethnography" (31-33).

[8] Moyer 2011, especially 84-141.

[9] Haubold 2013, especially 78-98.

[10] Woolf 2011 17-19; Vlassopoulos 2013b performs a similar analysis of the "middle ground" (without using the term) in his studies of Herodotus' stories, especially on the use of Greek myth by foreign peoples.

and his murky predecessors and influences,[11] though more recently there has been a push to go beyond the canonical texts and include less studied authors plus the visual and material record in studies of intercultural contact.[12] Scholars such as Skinner have begun to push the boundaries of what can be considered ethnography or ethnographic to include all representations of foreign peoples and their customs.[13]

In this chapter, I will examine on how plants function in ethnographic accounts. Here I will make full use of my test case of India. I will focus on the accounts of authors who deal with India and its peoples to see how plants inform these authors' accounts. Nevertheless, my conclusions are not limited to India alone. The insights my study of Indian exotic plants provides can, I believe, be extended to other ethnographic texts dealing with other exotic cultures. First, though, it seems necessary to explain why I am looking at how these writers write about plants. Although ethnographic texts focus on *people* and how they live, worship, and interact, the world the people live in is also included. The authors' primary intent is to tell the story from the peoples' point of view, and plants and climate are described only insofar as they are relevant to the understanding of people. But by focusing on what these authors have to say about plants, a connection is visible between Greek beliefs about the importance of their own use of plants and how they project these beliefs onto foreign peoples. To explore these ideas, I will survey some ways in which plants function as cultural symbols: as part of golden age idealism, as components of scientific theories about human and cultural development, and

[11] Hartog 1988 is the biggest example here, which may have set the trend, but see also the excellent study of Thomas 2000.

[12] See Woolf 2011 on lesser-studied Roman ethnographies, Moyer 2011 on Manetho and Egypt, and Haubold 2013 on Berossus and Babylon. But see Dench 2013 on the continuing trend (which this chapter does nothing to buck) of favoring analysis of Greek over Roman sources.

[13] Skinner 2012 7-17. This includes anything that involves looking at another culture from the outside: poetry, material culture, as well as prose texts. According to him, any instance of "thinking about culture from the point of view of an outsider" can be considered ethnography (16-17).

as the examples *par excellence* of the dichotomy between wild and cultivated. Together, these uses of plants display a scientific and cultural framework that evolved to account for the place of plants in Greek ethnography. This process culminates in the Hellenistic period, when writers of ethnographic texts had a wealth of new data as well as well-developed theoretical frameworks through which to examine it. Knowledge about exotic flora was filtered through existing cultural, scientific, and botanical theories to provide a way to understand foreign peoples based on their relationships with plants. The resulting discussion of the place of plants in the study of culture shows that plants were a vital part of Greek and Roman beliefs about cultural development and that the theories they invented to explain their own relationships with the natural world were shifted to the outside in ethnographic writing. There is much to be said for choosing a plant-based viewpoint. By looking from a plant's perspective, we see Greeks explaining new peoples and places in terms familiar to them and understanding new cultures through native flora and plant cultivation. To sum up and adapt a famous passage from the Northwest Ordinance of 1787: "Land, environment, and climate, being important to ancient ethnography and modern scholarship, study of the place of plants in these texts shall forever be encouraged."[14]

2.1 Plants as cultural objects

In this first section, I will display how plants are important markers of culture. This importance stems from the special nature of plants: they are immobile, and thus are living symbols of the land they grow from. Crops grow better or worse depending both on the environment and on human tending, so a lush harvest can display intrinsic qualities of the

[14] The original quotation, inscribed across the entrance to Angell Hall at the University of Michigan, Ann Arbor: "Religion, morality, and knowledge, being necessary to good government and the happiness of mankind, schools and the means of education shall forever be encouraged."

land, diligence, and industry on the part of its inhabitants, or both. Knowledge about plants was a valuable way to understand culture, both domestic and foreign, and conversely, knowledge about culture is displayed in descriptions of plants in texts.[15]

The importance of the fruitfulness of the earth to the conception of a culture is seen in Greece from the earliest period, such as in the description of the shield of Achilles in *Iliad* 18, where a scene of plowing (541-549), one of reaping (550-560), and another of the grape vintage (561-572) are juxtaposed with the city at peace and the city at war.[16] To understand the importance of plants in Greek writings about culture, I will now go through three areas where plants have a large part to play in cultural myths and theories. First, the image of a golden age, whether located in the distant past or at the edge of the earth, owes much of its vividness to plants. More specifically, in the golden age, plants produce food for humans without any cultivation. The standard description of the fertility of the golden age is in Hesiod, *WD* 117-118: καρπὸν δ' ἔφερε ζείδωρος ἄρουρα αὐτομάτη πολλόν τε καὶ ἄφθονον (the grain-giving field of its own accord bore fruit, much and unwithering). Hesiod applies a similar description to the Isles of the Blessed at *WD* 172-173: τοῖσιν μελιηδέα καρπὸν τρὶς ἔτεος θάλλοντα φέρει ζείδωρος ἄρουρα (for the [the heroes] the grain-giving field bears honey-sweet fruit that ripens three times per year). This notion of a golden age is one that later authors were able to apply when writing about foreign cultures, especially to India.

[15] This can be compared to Hartog's famous "mirror" (1988 7-11): each predicate Herodotus attributes to the Scythians is meant to be compared with its Greek counterpart. Thus we learn not about the Scythians, but about the Greek view of foreigners and themselves. But I do not wish to set one side against another in strict opposition, but rather to view influences and contacts from both sides at once. Greeks view Indians on a scale of development, as I discuss below, allowing them to assign Indians a place on a continuum of human relationships with plants and the natural world.

[16] See Cole 2010 197-198 for a discussion of the shield and its importance as an early example of Greek representation of space in text.

Second, and running somewhat counter to their presence in mythologized accounts of the golden age, plants have a significant place in fifth and fourth century rationalist accounts of *Kulturgeschichte*, that is, of the development of Greek culture.[17] In these texts, the productivity of the land is connected to the state of human civilization, and there is an important analogy between plant *cultivation* and human *culture*.[18] These theories could be readily applied to ethnography. Foreign peoples could be viewed in keeping with a scheme of cultural development, and a major way this is seen is through the interactions the people are said to have with plants, especially when viewed in comparison with the interactions that are familiar to the author's audience. Relevant ethnographic questions that interact with theories of *Kulturgeschichte* include what kinds of plants are found in a given foreign place and whether the people practice agriculture.

Third, I will turn to philosophical, scientific, and botanical theories concerning plants and how they work, especially regarding the necessity of cultivation. In these theories, the contrast between nature and culture, νόμος and φύσις, is clearly expressed. Additionally, the scientific concepts of "wild" and "cultivated," as applied to crops, reflect the ideas authors had about the people who dealt with these plants. From a combination of these viewpoints the place of cultivated and wild plants in ethnography will be clear. Plants served both as a valuable two-way metaphor for human culture and as receptacles for ideas about that culture.

---

[17] See the introduction to Cole 1999, where he cites Preller's distinction between "Hesiodic fantasy" and "Ionian science" (1). Cole sees a "clear if limited victory" for science starting in the 5th century BCE, and ascribes the impetus for this victory to the *Kulturgeschichte* of Democritus, which won over myth-based accounts of extreme fertility and happiness under the reign of Uranus.

[18] Relevant here is Theophrastus' strict division of the plant world into wild (ἄγριος) and cultivated (ἥμερος) plants. For instance, cultivated trees are discussed in book 2 of the *HP*, and book 3 begins with a programmatic shift to wild trees: ἐπεὶ δὲ περὶ τῶν ἡμέρων δένδρων εἴρηται, λεκτέον ὁμοίως καὶ περὶ τῶν ἀγρίων, ἔι τέ τι ταὐτὸν καὶ ἕτερον ἔχουσι τοῖς ἡμέροις εἴ θ' ὅλως ἴδιον τῆς φύσεως ("Since I have spoken about cultivated trees, I must now speak in the same way about wild trees as well, to see whether they are in some respect the same or different from cultivated ones and to see if they are utterly unique in their natures; *HP* 3.1.1).

A wild plant could be indicative of what was viewed as a wild or primitive culture, or a culture's perceived wildness could be represented through a description of its plants. For instance, Theophrastus' discussion of a half-wild olive growing in India reflects a cultural viewpoint about the developmental status of the Indian people, especially taken in contrast to other authors' reports of a dearth of olive trees in the east.

Discussing the cultural importance of plants becomes more difficult when the culture in question is located on the edge of the earth, and the plants involved are less familiar than grains and grapes, the primary crops referred to in Greek accounts of cultural development. By examining more closely how Indian flora is described—What plants are there? How do they grow? How are they used by Indians?—we can see how the conception of India that emerges from its flora reflects the ideas about culture held by various writers of ethnography. In these ethnographic texts we can see marvelous trees that produce lac resin, that grow "wool," that are so large they constitute a forest all to themselves. Additionally, more prosaic plants grow in uncommon ways: wheat is harvested twice a year from the same plot, rice grows submerged in water, and tree fruits grow to immense size. Anecdotes of this kind are present in most writing that involves India, and from them we can see how India is originally conceptualized as the location of a golden age. Eventually, this conception becomes challenged in the face of new scientific theories about human development and new information coming from contact with actual Indians. In these later authors, India becomes a subject for rational and theoretical inquiry, a place to which ideas about cultural development could be attributed.

2.1.1 Plants and the golden age

At the earliest stage of this process, the idea of the golden age and the heroic past were prominent in the minds of Greek authors, and the "naturalization" of history and cultural development had not yet emerged.[19] One notable feature that Greek ideas of a golden age have in common is that they are vegetarian. There is no violent killing of animals for food.[20] In Aratus' description of the succession of ages (*Phaenomena* 96-136) he notes that it was first during the Bronze Age that plow-oxen were eaten:

> ἀλλ᾽ ὅτε δὴ κἀκεῖνοι ἐτέθνασαν, οἱ δ᾽ ἐγένοντο,
> χαλκείη γενεή, προτέρων ὀλοώτεροι ἄνδρες,
> οἳ πρῶτοι κακόεργον ἐχαλκεύσαντο μάχαιραν
> εἰνοδίην, πρῶτοι δὲ βοῶν ἐπάσαντ᾽ ἀροτήρων. (129-132)
>
> When they [*sc.* the silver age peoples] had died, a new bronze people was born, men more destructive than those who preceded them. They first forged the evil-doing knife of the highway robber; they first ate the plow-oxen.

The eating of meat goes along with the descent of humanity, which further emphasizes the importance of plants and a plant-based diet as golden age tropes. As an example, we can consider Homer's lotus-eaters, who display many of the characteristics of golden age idealism.[21] Thus, when in ethnography authors portray lands as lush, fertile, and hypertrophic, they bring up golden age connotations for the inhabitants of those lands.[22]

---

[19] Cole 1999 states in his introduction that "[i]n 400 B.C. it was still necessary for Thucydides to write a refutation of those who would exaggerate the scale and importance of the Trojan War; there is nothing comparable in later writing" (1). Through the influence of various strands of pre-Socratic and sophistic thought the past became a place for rational inquiry and theorizing rather than an inaccessible realm of mythical abundance.

[20] See Haussleiter 1935 54-64 and Sorabji 1993 174-178. Porphyry at *De abstinentia* 2.5-9 preserves Theophrastus' account of the descent from the golden age (probably from *On Piety*), which details how sacrifice devolved from offerings of grass to butchered animals.

[21] *Odyssey* 9.82-102. See also Skinner 2012 56-7.

[22] Karttunen 1989 122-126 discusses the τόπος of extreme natural abundance throughout Greek ethnography, and how it is not specific to a single region.

For Greeks writing about India in particular, this trope was part of the earliest ethnography. Reports of first-hand Greek contact with the eastern world go back at least to the times of the explorer Skylax of Caryanda (*BNJ* 709), the first recorded Greek to go on a *periegesis*. He explored the Indus Valley at the instigation of Darius I of Persia, who conquered the Indus Valley sometime before 513.[23] We have fragments of the report Skylax composed on what he saw.[24] We know that in this expedition he noted the unusual flora of the land he was surveying because among the few remaining fragments of his work there is reference to the plants that grow in India:

> καὶ Σκύλαξ δὲ ἢ Πολέμων γράφει· εἶναι δὲ τὴν γῆν ὑδρηλὴν κρήνησι καὶ ὀχετοῖσιν· ἐν δὲ τοῖς οὐρεσι πέφυκε κυνάρα καὶ βοτάνη ἄλλη. (*BNJ* 709 F 3)
>
> And Skylax or Polemon writes that the land is well-watered with springs and streams, and the *kunara* and other plant life grows in the mountains.

Later historians and ethnographers continue in this vein, describing the eastern boundary of the world as incredibly fertile and full of exotic plants. Among these is another περιηγητής, Hecataeus of Miletus, whose fragments include a few references to India (*BNJ* 1 F 294-F 299). Among these is a reference to the same mysterious plant, the *kunara*:[25]

---

[23] See Parker 2008 13-14 for a brief account of the conception of India under Darius I.

[24] Though scholars used to doubt that this voyage actually took place, Persian inscriptional evidence has lent credibility to its historicity. See Parker 2008 11ff.

[25] The κυνάρα is typically identified with κινάρα and translated "artichoke" (see LSJ *s.v.*). The modern taxonomic classification for the globe artichoke is *Cynara cardunculus* L., yet the range of cultivation of the modern artichoke and its wild variants is limited to the Mediterranean basin and the Near East (see Rottenberg and Zohary 1996). Additionally, Hehn 1902 includes the artichoke as a native European plant: "Wie der Kohl is auch die Artischocke eine in Europa einheimische, veredelte Distel" (516). The full context of the fragment of Skylax is Athenaeus' discussion of the artichoke (II 70A-71B). This passage seems hopelessly confused. The lemma is κινάρα; the authors using the form κυνάρα are all fragmentary (Skylax, Hecataeus, and Sophocles in two lost plays). Athenaeus also preserves the comment of the grammarian Didymus on Sophocles' usage of the work κυνάρα: μήποτε ... τὴν κυνόσβατον λέγει διὰ τὸ ἀκανθῶδες καὶ τραχὺ εἶναι τὸ φυτόν (70C). The κυνόσβατον or "dog thorn" or "wild rose" is perhaps a more suitable candidate for the κυνάρα. The confusion with the artichoke would then be due to both plants' having thorns. In the same passage, Sophocles is reported to have referred to the κυνάρα in his *Colchides* (F 348 *TrGF* iv) and to a κύναρος ἄκανθα in his *Phoenix* (F 718 *TrGF* iv). The remainder of

καὶ περὶ τὸν Ἰνδὸν δέ φησι ποταμὸν γίνεσθαι τὴν κυνάραν. (F 296 = Athenaeus II 70B)

And he says that the *kunara* grows in the region of the Indus River.

From this appearance of the *kunara* in both authors, it has been theorized that Hecataeus got his information about India from Skylax, but this cannot be known for certain.[26] Whether or not this is the case, it is clear that both Skylax and Hecataeus were interested in Indian flora in their accounts of the country, and both mention this specific plant that grows there. It is speculation to go beyond this, however. Because of the fragmentary state of the evidence, it is difficult to get a full sense of the conception of India and its plants that these two early authors held. To get a fuller account of India, we must now turn to that most famous ethnographic text: Herodotus' *Histories*.[27]

As both the first completely extant source on India and as a source that was widely known in the ancient world, the *Histories* display a view of India that was influential for centuries, even when new information should have corrected its "errors."[28] Like his predecessors, Herodotus often highlights the lushness of the east when comparing it to the Mediterranean Greek world. In particular, Herodotus' description of India is overlaid with images from the golden age. He states that the furthest regions of the inhabited world have received the best things as their lot (αἱ δ' ἐσχατιαί κως τῆς οἰκεομένης τὰ κάλλιστα ἔλαχον; 3.106.1). Here, their richness is set against the infertility of Greece, though Greece has received

---

the Athenaeus passage is concerned with the κάκτος, which is certainly an artichoke or cardoon; it is found on Sicily and has an edible "heart." For these reasons I hold off on translating κυνάρα as "artichoke."

[26] See Parker 2008 20, though his assertion that Hecataeus and Skylax compared the shape of the Indus to a *kunara* is not found in Athenaeus.

[27] For Herodotus' differences from his predecessors, see Romm 1992 32-41, who points out how Herodotus rejected the idea of the river Ocean and established deserts on the borders of his *oikoumenê*.

[28] See Murray 1972 for a study of how Hellenistic historians display their debt to Herodotus, partly by propagating his mistakes.

as an allotment the best seasons (ἡ Ἑλλὰς τὰς ὥρας πολλόν τι κάλλιστα κεκρημένας ἔλαχε; 3.106.1). The contrast here is between the core of the inhabited world (Greece) and its edge (from the Greek perspective),[29] and a similar contrast is apparent between the edge of the *oikoumenê* and the land beyond its borders:

> Ἰνδῶν γὰρ τὸ πρὸς τὴν ἠῶ ἐρημίη ἐστὶ διὰ τὴν ψάμμον. (3.98)
>
> μέχρι δὲ τῆς Ἰνδικῆς οἰκέεται Ἀσίη· τὸ δὲ ἀπὸ ταύτης ἔρημος ἤδη τὸ πρὸς τὴν ἠῶ, οὐδὲ ἔχει οὐδεὶς φράσαι οἷον δή τι ἐστί. (4.40.2)
>
> The eastern side of India is desert on account of the sand.
>
> Asia is inhabited up through India but from there it is a desert towards the east, and no one is able to declare what the place is like.

Indeed, in this view, India is the eastern endpoint of the inhabited world and land beyond it *must* be an uninhabited wasteland. The fertility of India and the east is further emphasized and made to stand out against the void beyond. I will return to Herodotus below, but his interest in the flora and fertility of India is apparent from even this brief discussion.

The next major author to write on India is Ctesias, a doctor at the Persian court, who composed an *Indica* in one book as a companion piece to his *Persica*.[30] Though Ctesias wrote at a later period than Herodotus,[31] and endeavored to correct what he viewed as Herodotus' errors,[32] his *Indica* maintains the golden age tropes that characterized the earlier version. This, however, may be due to the nature of the sources left to us and to the writers who followed him. Photius and the other excerptors have a general tendency to preserve interesting and exotic details and to eliminate any rationalist account behind them. Additionally, after the

[29] Cf. Thomas 2000 105-6, Rosellini and Saïd 1978.

[30] See Vlassopoulos 2013a 219-221 for a brief account of Ctesias' life and career.

[31] During the reign of Artaxerxes Memnon, whose physician he was (Lenfant 2004 T1, T1b, T2, T3); he is also mentioned in the *Anabasis* of his contemporary Xenophon (1.8.26-27 = Lenfant 2004 T6aβ).

[32] See Lenfant 2004 xxvii-xxxii.

writings of Megasthenes and the Alexander historians were available, Ctesias became less trusted for factual information about India.[33] But even in what remains, it is clear that Ctesias goes beyond his predecessor in attributing exotic wonders to the east. In his *Indica* there are references to incredible natural abundance, often expressed in terms of flora. For instance, he discusses a certain highly productive and useful kind of Indian tree, the *siptachora*, which harbors the insects that produce lac resin:

> φασὶ γὰρ ἐν τοῖς ὄρεσι δένδρα εἶναι ὑπερέχοντα τοῦ ὕδατος· ὕδατι γὰρ ῥεῖται τὰ ὄρη· εἶτα ὥρα ἐστὶν ὅτε δάκρυα φέρει, ὥσπερ ἀμυγδαλῆ ἢ πίτυς ἢ ἄλλο τι δένδρον, μάλιστα δὲ εἰς λ΄ ἡμέρας τοῦ ἐνιαυτοῦ. εἶτα ἀποπίπτει τὰ δάκρυα ταῦτα εἰς τὸν ποταμὸν καὶ πήγνυται. τῷ δενδρέῳ δὲ τούτῳ ὄνομά ἐστιν Ἰνδιστὶ σιπταχόρα, Ἑλληνιστὶ σημαίνει γλυκύ, ἡδύ, κἀκεῖθεν οἱ Ἰνδοὶ συλλέγουσι τὸ ἤλεκτρον. φέρειν δὲ καὶ κάρπον τὰ δένδρα βότρυς, ὥσπερ ἄμπελος, ἔχειν δὲ τὰς ῥῶγας ὥσπερ κάρυα τὰ ποντικά. (Lenfant 2004 F45.36)
>
> They say there are trees in the mountains overlooking the water (for the mountains flow with streams). Then there is a season when they produce "tears" of sap, just like the almond, pine, or some other tree, during only 30 days of the year. Then these tears fall off into the river and congeal. The name for this tree in Indian is "siptachora;" in Greek this means "sweet, pleasant." And in this place, the Indians gather the "amber." They say the trees also produce fruit in bunches, just like the grapevine, and that they have berries just like the Pontic nut tree.[34]

This is only one of the many examples of India's fertility in Ctesias' account that have been preserved in Photius' epitome and other fragments of the *Indica*. Ctesias also mentions massive reeds (Lenfant 2004 F45.14) and a tree that attracts precious metals with its roots (Lenfant 2004 F45.35). But due to the nature of the sources, few overarching themes are apparent: the use Ctesias put these marvels to has been lost. The overall impression a reader

[33] Parker 2008 28ff., 57-8.

[34] Lenfant 2004 *ad loc.* notes that the amber should instead be identified as lac, and suggests an identification of jujube (*Zizyphus jujuba*) or Indian fig (*Ficus indica*) for the tree, both of which produce fruit and harbor the insects that produce lac resin. Nichols 2011 *ad loc.* adds the suggestion of Gular fig (*Ficus racemosa* or *Ficus glomerata*), which is particularly found on riverbeds.

receives is of a land where everything is more verdant and productive, yet still wild and marvelous.

Even after Alexander's conquests, the trope of the golden age is still important for the ethnography of the Alexander historians and Megasthenes, and the India of these writers remains to some extent a mythical place.[35] Additionally, here too we are dealing with fragmentary sources that were often preserved more for their content than their theory. But the expeditions of Alexander did in fact open the east to first-person accounts of science, and therefore to scientific botany. This process played a role in the descriptions of the land and its peoples that we find in some fragments of Aristobulus, Onesicritus, and Megasthenes. The information presented is often of a higher quality, if scientific accuracy in a modern sense is used as a criterion for judgment, and the plants described in these texts are more easily identified. Megasthenes refers to cotton (*BNJ* 715 F 8), and long, scientifically-minded descriptions of the cultivation of rice were provided by Aristobulus and the otherwise unknown Megillus (*BNJ* 139 F 35). In these instances, Indian flora is treated as something real that can be investigated, and not as the trappings of a golden age land. But this tendency is far from universal.

Despite first-hand contact, the older notion of extreme Indian fertility does not entirely disappear, even in Megasthenes.[36] In his account, it seems that the Indian golden age remains even after the arrival of Dionysus, Heracles, and civilization.[37] According to Megasthenes, even

[35] See especially Murray 1972.

[36] Though Megasthenes shows influence from *Kulturgeschichte* as well in his ethnography. See Kosmin 2013 and below.

[37] For Dionysus and Heracles as culture-bringers to India, see Megasthenes *BNJ* 715 F 4 and 14.

at the current time the land of India is marvelously productive, to an unrealistic extent reminiscent of the golden age:

> ἡ δ' οὖν Ἰνδικὴ πολλὰ μὲν ὄρη καὶ μεγάλα ἔχει δένδρεσι παντοδαποῖς καρπίμοις πλήθοντα, πολλὰ δὲ πεδία καὶ μεγάλα καρποφόρα τῷ μὲν κάλλει διάφορα, ποταμῶν δὲ πλήθεσι διαρρεόμενα. (*BNJ* 715 F 4 = Diodorus 2.35.3)
>
> India has many large mountains that are full of a large number of fruit trees of every type, and many large fruit-bearing plains, distinctive in their beauty and transected by a number of rivers.

India's land is completely productive in all crops, and also has rich mineral resources (ἡ δὲ γῆ πάμφορος οὖσα τοῖς ἡμέροις καρποῖς ἔχει καὶ φλέβας καταγείους πολλῶν καὶ παντοδαπῶν μετάλλων; *BNJ* 715 F 4 = Diodorus 2.36.2). The country has two harvests a year and never suffers from famine:

> Μεγασθένης δὲ τὴν εὐδαιμονίαν τῆς Ἰνδικῆς ἐπισημαίνεται τῷ δίκαρπον εἶναι καὶ δίφορον ... τὸν μὲν εἰπὼν σπόρον χειμερινὸν τὸν δὲ θερινόν, καὶ ὄμβρον ὁμοίως· οὐδὲν γὰρ ἔτος εὑρίσκεσθαί φησι πρὸς ἀμφοτέρους καιροὺς ἄνομβρον· ὥστ' εὐετηρίαν ἐκ τούτου συμβαίνειν ἀφόρου μηδέποτε τῆς γῆς οὔσης. (*BNJ* 715 F 8 = Strabo 15.1.20)
>
> Megasthenes demonstrates the fertility of India through its producing crops twice a year and having two harvests ... mentioning the winter and the summer sowing, and the rains likewise. No year is found to lack rain for both crops, he says, so plenty results from this, since the land is never barren.

From these passages we can see that for all of his first-hand experience at the court of the Chandragupta, the Mauryan king,[38] Megasthenes maintains vestiges of the golden age tradition that Skylax employs, and his *Indica* includes the same kind of non-specific descriptions of India as having a lush, hypertrophic environment that produced fruit and grain freely and benevolently, without much need for the guiding hand of humans. Granted, the real India is a more fertile place than Greece, but Megasthenes' account, which calls the land πάμφορος of all cultivated crops and praises its εὐδαιμονία, goes a step beyond a measured,

[38] *BNJ* 715 T 2a, 2b, and 2c.

realistic account and imbues India with fertility beyond reasonable bounds. The persistence of this trope of India's golden age in spite of first-hand contact is an issue I will explore further below.

2.1.2 Theories of cultural development

Now it is time to turn to a newer and competing way of conceiving of distant lands: through the lens of cultural history and human development. In Greek literature of the 5th and 4th centuries BCE, the development of humanity from a bestial state to civilization and the development of an individual human being from infancy to adulthood were topics that fascinated the authors of scientific treatises as well as authors who had wider audiences. First, it is useful to get a sense of the place of plants in 5th and 4th century Greek conceptions of their own culture and cultural development. Then we can examine how this internal standard was used when authors turned their attentions to interactions with distant lands and peoples. Cole (1999) discusses the various views 5th and 4th century authors had on the development of several features of civilization, including the importance of plants and agriculture for them. He sets out a scheme for stages in the development of culture, based on accounts in Vitruvius, Diodorus, John Tzetzes, Lucretius, and Posidonius. I will refer below to his stages, which begin as follows:

(1A) Nomadism
(1B) Dependence on food gathering
(1C) No knowledge of fire, clothing, or shelter
(1D) No knowledge of storing food; starvation common

(2A) Rudimentary shelter
(2B) Food storage

(3A) Houses
(3B) Clothing

(3C) Fire
(3D) Grain and how to cook it

(4A) Society formation
(4B) Language
(4C) Technology via competition

(5A) Further technological development
(5B) Metallurgy
(5C) Tools for warfare
(5D) Tools for weaving
(5E) Tools for agriculture[39]

Plants are directly important for stages 1B (food gathering), 2B (innovations for food storage), 3D (discovery of grain), and 5E (development of metal tools for agriculture), and indirectly important for stages 3B (discovery of clothing) and 5D (development of tools for weaving fibers). I do not mean for Cole's stages to be taken as rigid, but rather as a conceptual framework that most Greek cultural historians would have been aware of, consciously or not.

Two examples of *Kulturgeschichte* in 4th century authors should give a flavor of its pervasive nature in many types of texts and how plants are involved in human cultural history. First, in Protagoras' myth of the origin of human civilization, as reported in Plato's dialogue of that name, the gift of fire is the primary civilizing impulse, but it allows humanity to discover the other trappings of civilized society, which include agriculture:

> ἐπειδὴ δὲ ὁ ἄνθρωπος θείας μετέσχε μοίρας, πρῶτον μὲν διὰ τὴν τοῦ θεοῦ συγγένειαν ζῴων μόνον θεοὺς ἐνόμισεν, καὶ ἐπεχείρει βωμούς τε ἱδρύεσθαι καὶ ἀγάλματα θεῶν· ἔπειτα φωνὴν καὶ ὀνόματα ταχὺ διηρθρώσατο τῇ τέχνῃ, καὶ οἰκήσεις καὶ ἐσθῆτας καὶ ὑποδέσεις καὶ στρωμνὰς καὶ τὰς ἐκ γῆς τροφὰς ηὕρετο. (322a)
>
> Since the human being had a share in a divine allotment, first, alone of animals it believed in the gods, due to its kinship with them, and it endeavored to build altars and statues for the gods; second, through skill it articulated speech and words, and it discovered dwellings and clothing and footwear and beds and nourishment from the earth.

[39] Cole 1999 26.

Protagoras here is trying to establish the difference between the benefits humans received from their first divine gift of Hephaestus' fire and Athena's arts (stolen by Prometheus) and those they later received: αἰδώς and δίκη (sent by Zeus; 322c). He positions agriculture as prior to the πολιτικὴ τέχνη that he claims to teach. It is a prerequisite of civilized society.

Certainly, there is no denying the prime position agriculture must have for a functioning society, but the plants involved can come to have symbolic associations in addition to merely providing sustenance. In fact, plants and agriculture can function in a city or culture's self-definition.[40] They can help a culture establish itself in opposition to other groups and thereby to embrace and even celebrate its own particular characteristics. Isocrates, when praising the good fortune of Athens, cites agriculture as one of its primary goods:

> πρῶτον μὲν τοίνυν, οὗ πρῶτον ἡ φύσις ἡμῶν ἐδεήθη, διὰ τῆς πόλεως τῆς ἡμετέρας ἐπορίσθη.... Δήμητρος γὰρ ἀφικομένης εἰς τὴν χώραν ... καὶ δούσης δωρεὰς διττὰς αἵπερ μέγισται τυγχάνουσιν οὖσαι, τούς τε καρπούς, οἳ τοῦ μὴ θηριωδῶς ζῆν ἡμᾶς αἴτιοι γεγόνασι, καὶ τὴν τελετήν ... ἡ πόλις ἡμῶν οὐ μόνον θεοφιλῶς ἀλλὰ καὶ φιλανθρώπως ἔσχεν, ὥστε κυρία γενομένη τοσούτων ἀγαθῶν οὐκ ἐφθόνησε τοῖς ἄλλοις, ἀλλ᾽ ὧν ἔλαβεν ἅπασι μετέδωκεν. (*Panegyricus* 28-29)
>
> First, that which our nature first required was provided by our city.... After Demeter came to our land ... and gave her twofold gifts, which happen to be the greatest of all, the fruits of the earth, which are the cause of our not living like the beasts, and the mysteries ... our city has been not only loved by the gods, but loving to other people: though it has mastery over so many good things it has not begrudged them to others, but has shared with all what it has received.[41]

Here, plants and agriculture are a gift from the gods, and they rank alongside the Eleusinian Mysteries in importance for Athens. Beyond their importance in the development of a common Greek culture, they are part of what makes Athens particularly Athenian. In a similar

[40] Consider, for example, Athena's gift of the olive tree to Athens (Herodotus 8.55, Apollodorus 3.14.1, Virgil, *Georgics* 1.18, Ovid, *Metamorphoses* 6.70ff.). The importance of the olive for a "Greek" style of civilization will be discussed below.

[41] For a similar use of agriculture in praise of the city, cf. Plato's *Menexenus* 237e-238a.

way, ethnographic writers refer to the plants of a community when trying to present and understand its essential characteristics. Further, how the community interacts with these plants sheds light on its developmental status, when viewed in the framework of *Kulturgeschichte*.

These notions of cultural development show up as well when we turn to end-of-the-earth ethnography. An example from Herodotus will show how his Indography reflects these ideas. An important botanical oddity that he mentions from India is cotton (ἔριον ἀπὸ ξύλου). He discusses this plant three times: at 3.47 in a description of a breastplate that was given by the Egyptian king Amasis to Polycrates and was subsequently stolen by the rebel Samians, at 3.106 when discussing the marvelous clothing of the Indians, and at 7.65 when he details the armaments of the various groups that compose Xerxes' army.[42] Even if we disregard the first anecdote as not involving India directly, the other two are direct references to the Indians' use of this crop for weaving and making clothes. Yet not all Indians enjoy cotton garments. The first tribe Herodotus describes wears clothing made of rushes:

> οὗτοι μὲν δὴ τῶν Ἰνδῶν φορέουσι ἐσθῆτα φλοΐνην· ἐπεὰν ἐκ τοῦ ποταμοῦ φλοῦν ἀμήσωσι καὶ κόψωσι, τὸ ἐνθεῦτεν φορμοῦ τρόπον καταπλέξαντες ὡς θώρηκα ἐνδύνουσι. (3.98)
>
> These Indians wear clothing of rushes. They reap and mow rushes from the river and then they plait them as one would a mat and wear them like a breastplate.

We begin to see here gradations in the descriptions of the various tribes that inhabit India.[43]

---

[42] In the first of these passages, the origin of the cotton is not specified, though it is part of a gift given by an Egyptian king. This cotton could have been a product of trade between Egypt and the east, or perhaps it could have been grown locally. Virgil refers to Ethiopian cotton at *Georgics* 2.120, though there is always the possibility that there is confusion between the eastern and western Ethiopians, a concept that dates back to Homer (*Odyssey* 1.21-25). If the cotton is indeed from Africa, Herodotus has placed the plant at both the eastern and southern frontiers of his world.

[43] See Cole 2010 207-210 for a plot of the relative "wildness" of Scythians as Herodotus' description recedes away from the coast and into the North. Parker 2008 24 discusses Herodotus' juxtaposition of tribes with differing characteristics as an example of his use of "polarity" in his ethnography.

Other examples of these newer, theoretical views of Indians and their plants permeate Herodotus' description of India. In his account of the satrapies that have to pay tribute to the Persian king, he makes it clear that "Indians" are not a homogeneous group and they do not all speak the same language (ἔστι δὲ πολλὰ ἔθνεα Ἰνδῶν καὶ οὐκ ὁμόφωνα σφίσι; 3.98). Nor do all of these groups use plants in the same ways. For instance, he mentions an Indian tribe that eats an unspecified type of cereal grain that could be rice or some type of millet or sorghum.[44] He describes the tribe as follows:

> οὔτε κτείνουσι οὐδὲν ἔμψυχον οὔτε τι σπείρουσι οὔτε οἰκίας νομίζουσι ἐκτῆσθαι ποιηφαγέουσί τε· καὶ αὐτοῖσι ἐστὶ ὅσον κέγχρος τὸ μέγαθος ἐν κάλυκι, αὐτόματον ἐκ τῆς γῆς γινόμενον, τὸ συλλέγοντες αὐτῇ τῇ κάλυκι ἕψουσί τε καὶ σιτέονται. (3.100)
>
> They neither kill any living thing nor do they sow nor are they accustomed to possess houses; they eat grass. And they have a grain about the size of millet in its husk, growing from the earth of its own accord; they gather it and cook and eat it with its husk.

This tribe has not discovered agriculture and exists in the gathering stage (Cole's 1B), though they know how to cook grain (Cole's 3D), a juxtaposition that is somewhat incongruous from the point of view of other histories of civilization. This group of Indians does not fit preconceived ideas about how human cultures develop: they are on a different track, somehow, from the one on which Greeks understood their own development to have taken place. These peaceful Indians are contrasted with a warlike group in 3.102, showing that India as a whole does not exist in the golden age. In fact, these warlike Indians are tasked with supplying gold (obtained via the famous gold-digging ants) to the Persian king; this is a task that displays a much higher degree of cultural development than pacifist grass-eating.

[44] Karttunen 1997 cautions against an identification with rice, since the number of cereals present in northern India was large and Herodotus' description of the plant is not specific to rice, as it omits what was later recognized as the most distinctive feature of rice: its cultivation in flooded paddies.

The garments made of plaited reeds that he describes at 3.98 (quoted above) are clearly the predecessors of truly woven clothing,[45] worn by a tribe that has not reached that stage of cultural development. The tribes that use cotton (Herodotus 3.109 and 9.75), on the other hand, show further evolution.[46] From this example and the one above, we see how Herodotus describes multiple groups of Indians, who exhibit differing levels of development when compared with Greeks and Persians. It seems Herodotus has adapted the reports he has received to reflect current scientific theories concerning the discovery and invention of cultural technology, at least to an extent. Some groups of Indians—the grass-eating grain-cooking group for one—display a problematization of these theories, where Herodotus seems to recognize essential differences between Indian and Greek cultural development. But, when taken generally, in Herodotus' work distance from Greece goes hand-in-hand with distance into the past.[47]

Some traces of developmental theory are evident in the fragments of Ctesias' *Indica* as well, though they are nearly overwhelmed with grotesquery. A few passages are preserved in Photius' epitome (Lenfant 2004 F45) that describe Indian tribes who exist in pre-Greek developmental stages, and it is here that we can see Ctesias' interest in the development of human culture, though the structure and context have mostly been lost. First, he briefly records the justice of the Indians (16), mentions a tribe that does not wear clothing but engages in pasturage (21-22), and describes another tribe that does not eat grain or drink water (44). But the centerpiece of his developmental ethnography is his account of the

[45] Cf. Lucretius 5.1350: *nexilis ante fuit vestis quam textile tegmen* and Diogenes of Oenoanda F 11; the relationship between these passages is discussed in Cole 1999 56.

[46] Cole's stages 3B and 5D.

[47] Cf. Hall 1989 149 and esp. 211: "[in Attic drama] a rich source of tragic irony was provided by the tension between the 'past' and the 'elsewhere'."

Cunocephali (37-43).[48] The members of this dog-headed tribe communicate by barking,[49] live in caves, and eat wild animals, but neither cook the flesh nor eat it raw.[50] The liminal nature of this tribe, their status as proto-humans, is clear from Ctesias' description.[51] Their interaction with the world of plants is shown in their diet and in their clothing. In addition to animal flesh, they eat the fruit of the *siptachora* tree (described at Lenfant 2004 F45.36a, quoted above):

> ἐσθίουσι δὲ καὶ τὸν καρπὸν τοῦ σιπταχόρου, ἀφ' οὗ τὸ ἤλεκτρον (γλυκὺς γὰρ), καὶ ξηραίνοντες αὐτούς, σπυρίδας συσσάσσουσιν ὥσπερ ἐν τοῖς Ἕλλησι τὴν ἀσταφίδα. (Lenfant 2004 F45.40)
>
> They eat also the fruit of the *siptachora*, the tree that produces amber (for the fruit is sweet). They dry the fruits and stuff baskets with them as they do in Greece with raisins.

---

[48] For possible identifications of the Cunocephali with Indian tribes, see Nichols 2011 123-124 and Karttunen 1989 180-185, who has references to earlier literature. The major question is whether this concerns a real Indian people or a native myth. In support of the mythical explanation, Kartunnen cites *Bṛhat Saṃhita* 14.25. With context:

> uttarataḥ kailāso himavān vasumān girir dhanuṣmāṃś ca |
> krauñco meruḥ kuravas tathottarāḥ kṣudramīnāś ca ||24||
> kaikayavasātiyāmunabhogaprasthārjunāyanāgnīdhrāḥ |
> ādarśāntardvīpitrigartaturagānanāḥ śvamukhāḥ ||25||
>
> In the north there is Mt. Kailāsa, Mt. Himavat, Mt. Vasumat, and Mt. Dhanuṣmat, [also] Mt. Krauñca, Mt. Meru, in the same way the northernmost Kurus and the Kṣudramīnas. [Also] the Kaikayas, the Vasātis, the Yāmunas, the Bhogaprasthas, the Arjunāyanas (descendants of Arjuna), the Āgnīdhras (fire-handlers), the Ādarśas (invisible ones), the Antardvīpins (island-dwellers?), the Trigartas, the Turangānanas (horse-faces), [and] the Śvamukhas (dog-faces).

A similar list of peoples appears in several *purāṇas*, and includes the *Śunāmukha.* See Karttunen 1989 181n207-208 for the text.

[49] See Cole 1999 60-69 on the development of language in primitive humans according to Vitruvius, Diodorus, and Lucretius.

[50] They merely roast the meat by putting it out in the sun: ὅταν δ' ἀποκτείνωσιν αὐτά, ὀπτῶσι πρὸς τὸν ἥλιον (40). See Cole 1999 30-32 on the development of houses, fire, and cooking. Cf. also Theophrastus' "half-wild" olive, below.

[51] Nichols 2011 124-125 aptly describes the status of the Cunocephali as "at once both human and animal, civilized and savage." See also Romm 1992 77-81, who sees elements of Aesopic folklore in these "Dog-heads." Also, the view of later authors could incline to either side of the beast-human continuum. Pliny *NH* 7.23 (= Lenfant 2004 F45pα) refers to the Cunocephali as *genus hominum capitibus caninis*, whereas Aelian *De Nat. Anim.* 4.46 (= Lenfant 2004 F45pγ.2) emphasizes their bestial qualities, avoiding calling them ἄνθρωποι, but merely saying that aside from their heads τὰ δ' ἄλλα ἀνθρώπων ἔχουσι.

The ability to store and preserve food is prior to the development of agriculture according to Cole,[52] and is connected to a nomadic lifestyle. Here too is a direct analogy to a similar behavior on the part of the Greeks: the Cunocephali dry siptachora fruit just as "we" dry grapes. The clothing of the Cunocephali is also interesting because their class distinctions are expressed in the material of their garments:

> τὴν δὲ ἐσθῆτα ἔχουσιν οὐ δασείαν, ἀλλὰ ψιλῶν τῶν μασθλημάτων λεπτοτάτων καὶ αὐτοὶ καὶ αἱ γυναῖκες αὐτῶν· οἱ δὲ πλουσιώτατοι αὐτῶν λίνα φοροῦσιν. οὗτοι δ' εἰσὶν ὀλίγοι. (Lenfant 2004 F45.42)
>
> They do not have shaggy garments, but [ones made from] very thin strips of leather. Both the men and the women wear these. But the richest among them wear linen, though these are few.

The difference between wearing hides (even if they are made from thin strips of leather) and wearing linen garments is analogous to the difference between savagery and civilization. These (presumably plaited) leather garments can be paralleled to the plaited rush garments worn by one of Herodotus' Indian tribes (3.98; discussed above with note).

These examples from Ctesias and Herodotus show the influx of theory from *Kulturgeschichte* into their ethnographical accounts of India. But it is important to note that these theoretical views are in tension with the golden age tropes that I discussed above. An additional complicating factor is added when ideas about the divides between nature and culture, wild and cultivated are added to this ethnographic mulligatawny.

2.1.3 Theories of human development

At the same time that these theories about cultural development and progress were current, a parallel analogy was being developed between the development of people and the

[52] Cole's stage 2B.

growth of plants. Factors such as natural environment and cultivation loom large in these accounts. The best example of this, as applied to an individual human being, comes from the large-scale analogy between the growth of a plant and the growth of a human embryo in the Hippocratic treatise *On the Nature of the Child*. This analogy begins with a statement that could apply to ethnography as well as embryology:

> ἡ τροφὴ καὶ ἡ αὔξησις τῶν παιδίων γίνεται, ὅκως ἂν τῇσι μήτρῃσιν ἴῃ τὰ ἀπὸ τῆς μητρός· καὶ ὅκως ἂν ἡ μήτηρ ἔχῃ ὑγιείης ἢ ἀσθενείης, ὧδε καὶ τὸ παιδίον ἔχει. ὥσπερ καὶ τὰ ἐν τῇ γῇ φυόμενα τρέφεται ἀπὸ τῆς γῆς, καὶ ὅκως ἂν ἡ γῆ ἔχῃ, οὕτω καὶ τὰ φυόμενα ἔχει ἐν τῇ γῇ. (§22; VII 514 Li.)
>
> The nourishment and growth of children come about as material from the mother arrives via the womb. The child has health or disease in the same way as does the mother. In the same way, the things growing in the earth are nourished from the earth and the things growing in the earth share in the conditions that the earth possesses.

The author is primarily concerned with the development of the human embryo, and, in reaching for an analogy to help explain the interconnected nature of the mother and child during the child's early development, he chooses the close connection between plants and the land from which they grow.[53]

The draw to this kind of explanation is on display in other Hippocratic texts as well. In the opening to the ethnographic section of *Airs, Waters, Places,* the author draws an explicit comparison between the types of plants a region produces and the type of people that live there:

> τὴν Ἀσίην πλεῖστον διαφέρειν φημὶ τῆς Εὐρώπης ἐς τὰς φύσιας τῶν συμπάντων τῶν τε ἐκ τῆς γῆς φυομένων καὶ τῶν ἀνθρώπων. πολὺ γὰρ καλλίονα καὶ μέζονα πάντα γίνεται ἐν τῇ Ἀσίῃ, ἥ τε χώρη τῆς χώρης ἡμερωτέρη καὶ τὰ ἤθεα τῶν ἀνθρώπων ἠπιώτερα καὶ εὐοργητότερα.... ἔχει δὲ κατὰ τὴν Ἀσίην οὐ πανταχῇ ὁμοίως, ἀλλ' ὅση μὲν τῆς χώρης ἐν μέσῳ κεῖται τοῦ θερμοῦ καὶ τοῦ ψυχροῦ, αὕτη μὲν εὐκαρποτάτη ἐστὶ καὶ

[53] See Lonie 1981 211-216 on the intellectual background for the study of plant development prior to the composition of this text. He cites Empedocles as "the first Greek biologist" (214) and makes reference to a number of his fragments, which draw the same analogy: D-K 31 B82 on the similarity between hair and leaves, B99 on the σαρνικὸν ὄζον ("fleshy shoot") of the ear, and A70 on the original development of trees as the first living things on earth.

> εὐδενδροτάτη καὶ εὐδιεστάτη καὶ ὕδασι καλλίστοισι κέχρηται τοῖσί τε οὐρανίοισι καὶ τοῖς ἐκ τῆς γῆς. οὔτε γὰρ ὑπὸ τοῦ θερμοῦ ἐκκέκαυται λίην οὔτε ὑπὸ αὐχμῶν καὶ ἀνυδρίης ἀναξηραίνεται, οὔτε ὑπὸ ψύχεος βεβιασμένη οὔτε νοτία τε καὶ διάβροχός ἐστιν ὑπό τε ὄμβρων πολλῶν καὶ χιόνος· τά τε ὡραῖα αὐτόθι πολλὰ εἰκὸς γίνεσθαι, ὁκόσα τε ἀπὸ σπερμάτων καὶ ὁκόσα αὐτὴ ἡ γῆ ἀναδιδοῖ φυτά, ὧν τοῖς καρποῖσι χρέονται ἄνθρωποι, ἡμεροῦντες ἐξ ἀγρίων καὶ ἐς ἐπιτήδειον μεταφυτεύοντες. (§12; II 52-54 Li)
>
> I declare that Asia differs to the greatest degree from Europe as regards the natures of all the things that are produced from the earth and of the people. Everything grows bigger and better in Asia, and the land is more easily cultivated and the characters of the people gentler and more docile.... Asia is not everywhere the same, but the portion of the land that lies in the middle of the hot and cold regions produces the most excellent fruit and trees and has the best weather and enjoys the most beautiful waters, both from the heavens and from the earth. It is neither excessively burned by the heat nor dried up by droughts and the lack of water, nor is it harmed by the cold nor rainy and damp from much rain and snow. The harvests there are likely to be many both from the plants that grow from seed and from what the earth herself gives forth. The people use the fruits of these plants, taming them from the wild state and transplanting them to a suitable location.

As the author proceeds to discuss how the differences between Asians and Europeans can be accounted for both by their natural environment and by the customs they employ, the analogy with plants is shown to be quite apt. What is put forth is not crude environmental determinism, but rather a nuanced view of the interrelationships between the effects of νόμος and φύσις.[54]

Another example from *Airs, Waters, Places* will show how nature and culture work in parallel ways for humans and for plants. The Macrocephali (14; II 58-60 Li.) have elongated heads due to custom, but this feature has become inborn due to the selective pressure exerted by the acquired trait. But, as they concern themselves less with the upkeep of this characteristic, due to interactions with other peoples, the custom weakens (ὁ γὰρ νόμος οὐκ ἔτι ἰσχύνει διὰ τὴν ὅμιλίην τῶν ἀνθφώπων). This is completely analogous to the effort

[54] *Pace* the more naive view put forth by Byl 1995 228-230. It is true that the picture is slightly complicated by the author's insistence on continent (Europe/Asia) as another major determining factor, as this leads to confusion over what is in control of what. See Thomas 2000 95-7, Romm 2010 220-223, and Woolf 2011 44-48.

required to domesticate a plant (apply νόμος) and to prevent it from "going wild" once domesticated. These processes are explicitly discussed in Theophrastus' botanical works, as I will soon discuss.

As we have seen with his interest in *Kulturgeschichte*, Herodotus makes use of these ideas of human development in his *Histories*. As Rosalind Thomas has shown, like the author of *Airs, Waters, Places,* Herodotus is interested in the debate over nature and culture, and imports Greek science to his ethnography.[55] The presence of νόμος and φύσις in these two texts, as well as elsewhere,[56] indicates how this topic was "in the air" in the late 5th and early 4th centuries.[57]

I discuss in more detail in chapter 4 the philosophical and methodological bases for Theophrastus' botanical work and his differences from Aristotle. In this chapter, I examine how his discussions of *nomos* and *phusis* as they relate to plant cultivation can be viewed as an ethnography of plants, especially as they relate to concepts of wild and cultivated. It is important to remember that Theophrastus was a Peripatetic with wide-ranging interests and not merely a botanist. Lost works of his, including *On Piety* (in which he gives a history of the evolution of sacrifice) and possibly *On Discoveries*, display an interest in *Kulturgeschichte*.[58] Beyond this, *Kulturgeschichte* was an established field of study within the Peripatetic school.

---

[55] Thomas 2000 44: Herodotus is concerned with exploring human φύσις, which is the same across different people with different νόμοι.

[56] Some other expressions of the primacy of νόμος include Herodotus' quoting of Pindar's maxim when telling the famous story of Darius' investigation of the burial customs of Greeks and Callatiae (3.38), and, taken to the point of parody, Hippias' speech in Plato's *Protagoras* (337c-338b).

[57] And thus it cannot be traced to a particular author or "source." See Thomas 2000 17-18. Thomas discusses the relationship between Herodotus' *Histories* and the Hippocratic *Airs, Waters, Places* at 42ff.

[58] Cole 1999 9 with note 26, 55-57 with note 26, and 137. For relevant fragments of *On Piety*, see Fortenbaugh et al. 1992 vol. 2, 584A-D (from Porphyry *De abstinentia ab esu animalium*) and 585. For a commentary on how this lost work of Theophrastus' relates to cultural history, see Obbink 1988.

Aristotle's pupil Dicaearchus wrote a *Life of Greece* that tried to, as Cole 1999 puts it, "place this history [*sc.* of Greece] into the larger context of human culture as a whole."[59] Indeed, Aristotle and Plato before him expressed views on the history of civilization.[60] Thus insofar as he combines an interest in the flora of the edges of the earth with an intellectual background in cultural history, Theophrastus can be considered to be part of the same theoretical ethnographic tradition we saw expressed in Herodotus and Ctesias above. This view of Theophrastus is uncommon but not unprecedented. Fraser, in the 1994 edited volume *Greek Historiography* devotes 25 pages to Theophrastus' accounts of the wider world, and Bretzl's 1903 monograph on the "botanical researches" during Alexander's campaigns draws heavily on Theophrastus. My account is more theoretical, though, since, as I will show in chapter 4, Theophrastus believes in a dual τέλος for plants: reproduction and producing fruit for humans. This belief, Aristotelian at its heart but heavily influenced by Plato and the Academy, is important for considering how Theophrastus understands the interactions between plants and people in the more "ethnographic" sections of his works: because plants can have the τέλος of producing fruit for human use, it is legitimate to read human culture out of discussions of plants.

Also, similarly to the cultural historians, who discuss bestial and civilized human cultures, Theophrastus made a division in the world of plants between wild and cultivated. This is evident in the organization of the *HP*: book 2 discusses cultivated varieties of trees but wild trees are treated in book 3. The key feature of cultivated plants is the effort they require from humans to remain cultivated. For this reason Theophrastus lays much emphasis on the

[59] See Cole 1999 4 and 54-55 for discussion.

[60] Plato most notably in *Laws* III. Cole 1999 discusses this passage apropos of its reaction to and rejection of Democritean theories at 54 and 97-106.

degeneration of many common crops when they are allowed to grow from seed, rather than from a cutting or from a graft, that is, "naturally" rather than "artificially."[61] The majority of book 2 is taken up with various labor-intensive techniques that should be employed in order to maintain and cultivate one's crops. If guiding human effort, νόμος in effect, is not supplied, the crops will degenerate: transplantation can affect fruiting (2.2.8), tending of one kind or another can affect the taste of the fruit (2.2.9-11), wheat, barley, and flax can all become darnel (2.4.1 and 8.7.1), and "foreign" varieties of grain become naturalized in three years (8.8.1). However, not everything is within the bounds of human effort:

> ὡσαύτως δὲ δῆλον ὅτι καὶ ὅσα ἐξημεροῦται τῶν ἀγρίων ἢ ἀπαγριούται τῶν ἡμέρων· τὰ μὲν γὰρ θεραπείᾳ τὰ δ' ἀθεραπευσίᾳ μεταβάλλει· πλὴν εἴ τις λέγοι μηδὲ μεταβολὴν ἀλλ' ἐπίδοσιν εἰς τὸ βέλτιον εἶναι καὶ χεῖρον· οὐ γὰρ οἷόν τε τὸν κότινον ποιεῖν ἐλάαν οὐδὲ τὴν ἀχράδα ποιεῖν ἄπιον οὐδὲ τὸν ἐρινεὸν συκῆν. (*HP* 2.2.12)
>
> Thus it is clear that some wild plants are cultivated and some cultivated plants become wild: the former change through tending and the latter through neglect. But someone might say that this is not a change but rather a progression toward the better and the worse. For it is not possible to make a wild olive (κότινος) cultivated (ἐλάα), nor to make a wild pear (ἀχράς) cultivated (ἄπιος), nor a wild fig (ἐρινεός) cultivated (συκῆ).

From this it is clear that human cultivation (θεραπεία/νόμος) cannot utterly alter the nature of a plant: it cannot effect a full μεταβολή, but only a ἐπίδοσις εἰς τὸ βέλτιον. Theophrastus makes a similar observation when discussing foreign cultivars of grain crops (8.8.1). As mentioned just above, these seeds become native in three years (μεταβάλλει δὲ τὰ ξενικὰ τῶν σπερμάτων μάλιστα μὲν ἐν τρισὶν ἔτεσιν εἰς τὰ ἐπιχώρια), but not all transplantations are equally possible.[62] It is generally best to move from an extreme climate (warm or cold) toward a milder one, and foreign and native seed should never be mixed, since they disagree in their

[61] *HP* 2.2.4-6 lists the trees that degenerate in this way, including fig, grapevine, olive (a wild olive grows from the seed of a cultivated variety), pomegranate, pear, apple, quince, almond, and oak.

[62] Hughes 1988 71 hypothesizes that this is due to the appearance of hybrid traits in the third generation of a cross.

times of sowing, their times of germination, and the kinds of cultivation they require. Here we see a difference between plants and people in the priority of the plant's φύσις: νόμος is not king over all plants.[63]

We have seen how these plants are directly significant for ethnography: they symbolize and define the culture that uses them, as the members of that culture interact with and nurture the plants, as a result of their cultural development. But they also have a secondary significance, as objects of a kind of ethnobotany. The relationship between plants and their natural environment is similar to that between people and where they live, as was recognized by authors such as Herodotus and the author of *Airs, Waters, Places,* except plants have this to a greater degree. In Theophrastus' theory, plants' ripenings are sometimes keyed to human needs and their φύσεις can require human assistance to grow, or can spurn it. Sometimes a wild plant can be cultivated, but if it is immune to change from outside pressure no amount of human νόμος can alter its φύσις. Sometimes a plant can tolerate different environments, but sometimes it will not. Hence, plants are deeply and fundamentally connected with the land in which they grow and with the people that cultivate them. Using this background into the various ways plants can be seen and used to define a culture, I will now return to ethnography, particularly Hellenistic ethnography of India, to show how these theories meet in ethnographic texts and how authors navigate the different traditions and integrate new data from contact with India, theoretical understandings from *Kulturgeschichte* and botany, and the ethnographic trope of the golden age.

[63] Noted by Hughes 1988 72: "locality is more important that cultivation and tendance."

2.2 Hellenistic Indography

Based on this picture of the development of Greek intellectual history as applied to ethnography, Herodotus' predecessors, Skylax and Hecataeus, fall into a pre-rationalized stage. Their conception of India, as far as we can tell from their fragments, involved the end-of-the-earth golden age τόποι we find maintained in Herodotus and later authors, but without attempts at naturalization and explanation in a scientific framework.[64] The attribution of a golden age to the end of the earth is a reflection of the authors' worldview that blends the mythic past with lands that are physically out of reach. Skylax, of course, is said to have led an expedition to India, and contacts through trade or via the Persian court were undoubtedly happening. But India remained beyond the grasp of most people, and the ones who made the journey—or met those who had—possessed only this mythologizing mode of dealing with a new and exciting place. If India is inaccessible, why shouldn't it be assimilated to a golden age?

The situation is different with Herodotus. He displays an early stage of attunement to "Ionian science," as we have seen with his interest in νόμος and φύσις, and the groups of Indians he describes are differentiated and display degrees of cultural development, per Cole's framework, evidenced by how they interact with plants. Yet the scientific thought current in Herodotus' time does not completely replace the older τόποι of a golden age found at the edge of the earth in his *Histories*. This leads to a complicated portrait of the Indians and their plants. India's fertility is given near constant emphasis when Herodotus discusses the plants that are found in the east. Furthermore, since his descriptions of these plants are often the first in

[64] For the end-of-earth τόποι in Herodotus and other writers as they apply to India see Karttunen 1989 122-126; for a more general treatment of these τόποι, see Rosellini and Saïd 1978, and for their appearance in Roman ethnography, Evans 1999 (and below). Karttunen and Rosellini and Saïd emphasize the golden age qualities of the periphery as opposed to the iron age that is found in the center of the world, whereas Evans is more concerned with the negative view of the periphery felt by Roman writers such as Pomponius Mela.

Greek literature, Herodotus establishes them in the ethnographic tradition. In the overall scheme of Herodotus' Indography, these plants more frequently serve the purpose of emphasizing the absolute otherness of India than locating the Indians on a scale of cultural advancement. They are presented as *thaumata*, perhaps interesting in their own right, but more as anecdotes than as objects for real study.[65]

As we move to Hellenistic historians, a moment for Ctesias. Beyond what I have discussed above, there is not much that can be reconstructed of his interest in the place of plants in human development in his *Indica*. The unfortunate loss of the entire work renders more analysis mere speculation. The overall impact of the work as we have it, though, is not very different from Herodotus'. In short, despite the new and exciting details and *thaumata* he includes, Ctesias does not represent much of a change from the viewpoints we see in Herodotus, even given his closer proximity to the land he was writing about, as he lived and worked in Persia. His India reflects both the early ideas of a blessed golden age and the defining characteristics of pre-modern cultures that do not interact with plants in the same ways or to the same extent as Greeks.

When we finally arrive in the Hellenistic period, we enter a time when the theories developed in *Kulturgeschichte* are commonplace, as are worldviews that weigh the importance of νόμος and φύσις, wild and cultivated. Thus the Alexander historians, Theophrastus, and later writers all have a well-developed theoretical background for their ethnographic investigations. Additionally, first-hand contact with India was no longer such a rarity after the Greco-Macedonian expedition reached the Hindu Kush and the Indus Valley. In these authors, plants such as rice and cotton are more accurately described, especially insofar as they are

[65] Cf. Thomas 2000 163, who states that Herodotus' marvels are the objects of contemporary science as well as curiosities and that "it is probably impossible to draw a line between" these two categories.

cultivated and used. The Indians who wear cotton (instead of wool) and eat rice (instead of barley or wheat) are shown to be at the same level of cultural development as the Greeks: their otherness is reflected only in the distinct φύσεις of their plants. Additionally, the stories of cultural origin that are applied to them mirror those for the Greeks themselves. Parker has emphasized how Megasthenes gives India an antiquity,[66] and Kosmin has argued for Megasthenes' attunement to currents of *Kulturgeschichte*, pointing to his stories about the arrival of Dionysus that transform Herodotus' account and give it diachronic depth.[67] According to Megasthenes, the Indians tell the story that before the arrival of the culture-bringer Dionysus (from the west!) the early Indians enjoyed a golden age, living off the fertility of the earth:[68]

> μυθολογοῦσι δὲ τοὺς ἀρχαιοτάτους ἀνθρώπους τροφαῖς μὲν κεχρῆσθαι τοῖς αὐτομάτως φυομένοις ἐκ τῆς γῆς καρποῖς, ἐσθῆσι δὲ ταῖς δοραῖς τῶν ἐγχωρίων ζῴων, καθάπερ καὶ παρ' Ἕλλησιν. ὁμοίως δὲ καὶ τῶν τεχνῶν τὰς εὑρέσεις καὶ τῶν ἄλλων τῶν πρὸς βίον χρησίμων ἐκ τοῦ κατ' ὀλίγον γενέσθαι, τῆς χρείας αὐτῆς ὑφηγουμένης. (*BNJ* 715 F 4 = Diodorus 2.38.2)
>
> They tell the story that the earliest people were nourished with fruits growing of their own accord from the earth, and their clothes were the skins of the animals of the land, just as among the Greeks. In a similar way, the discoveries of the arts and the other things useful for life happened little by little, with Utility herself leading the way.[69]

Nevertheless, the juxtaposition of golden age imagery with the discovery of culture and technology is a bit strange: why was it necessary to discover the arts if life was already good?

---

[66] Parker 2008 47.

[67] Kosmin 2013 99-103.

[68] The presence of these bringers of culture mirrors that found in Diodorus' *Aegyptiaca* and other accounts of the history of civilization that Cole (1999 48-49, 153-163) traces to the influence of Euhemerus, who attributed various discoveries and inventions to specific, named gods. There are many parallels between these accounts and the prehistory of India as presented by Megasthenes, but this falls outside the scope of this chapter.

[69] This version, from Diodorus, is more utopian in its picture of prehistoric India than the parallel section of Arrian's *Indica* (7.1-8.3 = *BNJ* 715 F 12) where the primitive Indians were nomadic meat-eaters without the blessings of a golden age, before the advent of Dionysus. This follows Arrian's typical anti-utopian bent. Cf. 9.8: καὶ τοὺς καρποὺς ἐν ταύτῃ τῇ χώρῃ πεπαίνεσθαί τε ταχύτερον μὲν τῆς ἄλλης ... καὶ φθίνειν ταχύτερον (Even the fruits in that land ripen more quickly than elsewhere ... and also decay more quickly).

The key phrase here is καθάπερ καὶ παρ' Ἕλλησιν: just as among the Greeks. This is clearly a wholesale imposition of a Greek history of culture onto an Indian golden age background. Regardless of the story Megasthenes received from the Indians, he reports it so it matches his own ideas about cultural development.

Yet this progressive aspect of Megasthenes' account must be somewhat tempered by his description of the land of the Indians (*BNJ* 715 F 4 = Diodorus 2.35.3 and *BNJ* 715 F 8 = Strabo 15.1.20, both quoted above), which retains many remarkable golden age features. The tenacity of this τόπος influenced Megasthenes in much the same way as it did Herodotus. But this τόπος is not present in Theophrastus to the same extent. Theophrastus' scientific leanings produce a more nuanced "iron age" picture of the flora of a still-exotic land, as is shown in his statement that India has many different climates and not all plants grow in all regions. This is due to his primary focus on the plants themselves. Plants are of utmost importance for the characterization of the golden age, and Theophrastus was forced to make a choice: either he could ignore the new hard data about Indian plants, or he could maintain the golden age τόπος. A true scientist, he opted to report the data. He did not have flawless information, however, so he attempts to explain the exotic flora in ways similar to how he explains the plants that he and other Greeks are already familiar with. This process is a way of understanding the Indians through their plants: the process of cultivating rice surely has something to say about the cultivators, just as is true for grape cultivation and the Greeks.

Theophrastus primarily writes about eastern and Indian plants in book 4 of his *Historia plantarum*.[70] Even if Theophrastus had not in fact received specimens of the plants he was describing, he does have accurate descriptions of banana, jackfruit, banyan, and other native

[70] Section 4.4 is concerned with Asia as a whole, though a large portion of it deals with India. This section is presented in parallel to ones on Egypt (4.2), Libya (4.3), and "the North" (4.5). For more in the structure and the sources of this book, see chapter 4.

Indian plants. These observations, though they do not possess the same thoroughness as his descriptions of familiar Mediterranean plants, still are clearly the result of scientific inquiry: the banyan in particular is described with an eye to scientific detail (*HP* 1.7.3 and 4.4.4), and is a clear improvement from the earlier account of Onesicritus.[71] It is in examples such as these that we begin to see how Theophrastus' botany welcomed the influx of new data.

When Theophrastus discusses the flora and environment of India in relation to people—locals, Greco-Macedonian troops, and other ethnographers and reporters—his position in the ethnographic tradition is assured. For instance, at 4.4.9 he discusses "Indian barley" as a food for the local population and also notes that it proved to be fatal when used as fodder for "the horses," which were presumably the horses of Alexander's expedition. Theophrastus also discusses rice specifically as a food product (4.4.10), and mentions how cotton is grown and also that it is used for clothing (4.4.8 and 4.7.7-8). He also reports on μῦθοι he has heard, for instance about snakes guarding cinnamon plants (9.5.1).[72] All in all, his accounts of Indian plants and the interactions people had with them are more concise and accurate than those given by his predecessors—the wild and exotic plants of Ctesias have no place here—and this is due to Theophrastus' general program of studying plants. He has privileged data over ethnographic trope.

Furthermore, the scientific accuracy Theophrastus displays often involves a more explicit rejection of golden age stereotypes about the fertility and fecundity of India that prevail in other authors. Thus, contrary to the authors discussed above, Theophrastus reports

[71] Without seeing an actual specimen, Theophrastus deduced that the additional "trunks" of the banyan were in fact adventitious roots. His description of the leaves as being as large as a shield, however, is not accurate. See below, chapter 4.

[72] This story is similar to Herodotus' account of snakes guarding frankincense bushes (3.107), and the technique is similar to what is seen in Ctesias and in the later paradoxographic tradition. See also Lloyd 1983 123.

that India is not entirely a lush utopia, but in fact contains different climates within it, and these favor the production of different crops, some of which are not quite as fertile as the ethnographic accounts suggest:

> διαφέρει δὲ καὶ αὕτη ἡ χώρα τῷ τὴν μὲν φέρειν ἔνια τὴν δὲ μὴ φέρειν· ἡ γὰρ ὀρεινὴ καὶ ἄμπελον ἔχει καὶ ἐλάαν καὶ τὰ ἀλλα ἀκρόδρυα· πλὴν ἄκαρπον τὴν ἐλάαν, καὶ σχεδὸν καὶ τὴν φύσιν ὥσπερ μεταξὺ κοτίνου καὶ ἐλάας ἐστὶ καὶ τῇ ὅλῃ μορφῇ. (*HP* 4.4.11)
>
> Moreover this country [*sc.* India] has distinctions in that one part bears certain things and another does not: the mountainous region has the vine and olive and the rest of the fruit trees, but the olive does not produce fruit, and in nature and in its whole shape it is almost between that of a wild olive (κότινος) and that of a cultivated olive (ἐλάα).[73]

Even when compared to the descriptions of India's environment quoted above from Megasthenes, Theophrastus' description is more realistic and scientific, and it presents a more nuanced picture of India as a real place that has its own distinctive flora, including some varieties that are not as productive or fertile as those found in Greece.[74] The difference between Theophrastus and Megasthenes (who were near contemporaries, though writing from very different places in the Greek world) could, of course, be due to the indirect transmission of Megasthenes' *Indica* in later excerptors whose agendas called for exoticism rather than scientific accuracy.

The above passage of Theophrastus does more than present a data-driven account of India's climate, however. It also draws upon the theories of cultural and human development that I have set out above, specifically in the description of the Indian olive. Olives were undoubtedly a defining crop for the Greeks. Nearchus, in his voyage along the coast of Persia, remarks on three separate occasions that the nearby lands do not have olive trees, despite the

[73] Amigues 1988-2006 *ad loc*. identifies the tree in question as *Olea ferruginea* Royle. See also Pliny *NH* 12.26: *oliva Indiae sterilis praeterquam oleastri fructus*.

[74] This problematization of India is similar to Herodotus' problematization of the geography of Scythia: the land is not completely desert; there are many sub-tribes living there: see Hartog 1988 13-14.

presence of many other fertile crops and trees. The olive is singled out as the sole plant that will not grow in these regions:

> ὁρμίζονται δὲ ἐν Βάδει χώρῳ τῆς Καρμανίης οἰκουμένῳ, δένδρεά τε πολλὰ ἥμερα πεφυκότα ἔχοντι πλὴν ἐλαίης καὶ ἀμπέλους ἀγαθάς, καὶ σιτοφόρῳ. (*BNJ* 133 F 1 VI = Arrian, *Indica* 32.5)
>
> They anchored in an inhabited region of Carmania called Badis, which possesses many cultivated trees growing, but not the olive, has good grapevines, and produces wheat.
>
> πλεύσαντες σταδίους ἑκατὸν ὁρμίζονται κατὰ ποταμὸν Ἄναμιν· ὁ δὲ χῶρος Ἁρμόζεια ἐκαλέετο. φίλια δὲ ἤδη καὶ πάμφορα ταύτῃ ἦν, πλὴν ἐλαῖαι οὐ πεφύκεσαν. (*BNJ* 133 F 1 X = Arrian, *Indica* 33.2)
>
> Having sailed 100 stades, they anchored on the Anamis river. The land was called Harmozia. There were very many pleasant things here, but olives did not grow.
>
> τὸ δὲ ἐπὶ τῷδε ὡς πρὸς ἄρκτον τε καὶ βορέην ἄνεμον ἰόντων καλῶς κεκρᾶσθαι τῶν ὡρέων· καὶ τὴν χώραν ποιώδεά τε εἶναι καὶ λειμῶνας ὑδρηλοὺς καὶ ἄμπελον πολλὴν φέρειν καὶ ὅσοι ἄλλοι καρποὶ πλὴν ἐλαίης. (*BNJ* 133 F 1 XII = Arrian, *Indica* 40.3)
>
> The [region of Persia] after this, as one proceeds toward the Bear and the north wind, has seasons that are well mixed. The land is grassy and the meadows are watered and it produces many grapevines and all the other fruits there are, except for the olive.

Nearchus' repetition of the claim that there were no olives to be found emphasizes the importance of this fruit for those who identify as Greeks. The lack of olives is significant: it is a lack of a plant with serious cultural resonances for the voyagers.

As far as modern scholars can ascertain, olives were probably not present in Persia or India at this time: there is no reference to olives in early Indian literature.[75] Despite Nearchus' failure to find olives on the Persian coast, we have seen that Theophrastus reports olive trees growing in the Indian mountains that produce fruit halfway between wild and cultivated olives.[76] Elsewhere in his botany, Theophrastus discusses the nature of plants and the

[75] Laufer 1919 index *s.v.* "olive."

[76] Another puzzling and somewhat inconsistent aspect of this passage is that olive trees in the Hindu Kush were obviously very far from the sea, yet Theophrastus declares that olives cannot grow more than 300 stades from the

necessary cultivation (νόμος) to keep them from reverting to the wild, noting that the seed of an ἐλάα was likely to produce a κότινος, and thus alternative methods of propagation (grafting, slips, etc.) were employed to produce clones of the parent tree. Additionally, olive trees can degenerate and become wild if they are not properly cared for (*HP* 2.3.1). So the presence of the half-wild tree in India shows a state that is apparently intermediate between proper cultivation and utter neglect: the necessary νόμοι to yield edible olives have not been applied. Additionally, as we have seen, the process of cultivating a wild tree is not always possible (*HP* 2.2.12, quoted above). This is the same situation of Herodotus' and Ctesias' half-civilized races, but transferred to the plant world. Here, we can infer cultural ideas about the the Indians from Theophrastus' discussion of the plant. Theophrastus' cultural assumptions about horticulture reflect deeper assumptions about what is necessary for a group of people to be truly civilized in the Greek fashion.[77]

2.3 Later traditions

As a coda to this chapter on Indian plants in ethnography, I will briefly examine how these plants make the leap into the Roman period. This slight excursus will demonstrate how Theophrastus' data-based ethnography of plants represents something of a pinnacle. Later ethnographical studies lack his scientific basis and insight. As the Seleucid Empire deflated westward, novel research was replaced by cataloging others' results. These writers use the same sources as Theophrastus and include their details and anecdotes but do not make original

sea: παραπλήσιον οὖν τὸ συμβαῖνον τοῦτο καὶ ἐπὶ τῆς ἐλάας· οὐδὲ γὰρ οὐδ' ἐκείνη δοκεῖ τριακοσίων σταδίων ἀπὸ θαλάττης ἐπάνω φύεσθαι (*HP* 6.2.4).

[77] There is an intriguing passage by Aelian (*De natura animalium* 13.18) where he describes the lushness of an Indian palace garden but remarks that olive trees cannot grow there. It is doubtful that description is directly based on Megasthenes, but the ideas present in it are similar to Nearchus' repeated denial of olive trees and Theophrastus' half-wild olive: the olive, a defining tree for Greeks cannot grow in this utterly foreign environment. See the next chapter.

contributions to understanding culture through plants or plants through culture. In fact, there is a marked turn toward golden age motifs in their writing. These ideas were current even in the Augustan period, as can be seen from the art of the period[78] and from a glance at Latin poetry. Virgil's fourth *Eclogue* and Horace's sixteenth *Epode* both make use of golden age imagery, and they display interesting and different reactions to the tropes I discussed above. Both reference a golden age and give similar descriptions of its features: the earth requires no cultivation (*nullo ... cultu* 4.18 and *reddit ... cererem tellus inarata* 16.43), yet produces various crops. Nevertheless, Horace's golden age is located far away and must be sought (*nos manet Oceanus circum vagus: arva beata / petamus, arva divites et insulas*; 41-42); it is a specific region on earth with specific climatic features (*neque largis / aquosus Eurus arva radat imbribus / pinguia nec siccis urantur semina glaebis / utrumque rege temperante caelitum*; 53-56). On the other hand, Virgil's golden age will come about without the need for travel (*ferrea primum / desinet ac toto surget gens aurea mundo*; 8-9), and, regardless of climate, every type of flora will grow everywhere (*omnis feret omnia tellus*; 39). Horace's presentation is more similar to the end-of-the-earth utopias we see in Greek ethnography, whereas Virgil's, leaving aside its association with Stoic ideas of cyclical ages, has more in common with concepts of empire expressed through control over vegetation (see chapter 3).[79]

Beyond ideas about the golden age, later authors mine earlier historians (including Theophrastus) for their accounts about India and its flora. Theophrastus, like Aristotle, gives the exotic plants he discusses a stamp of legitimacy, as it were, for writers of later traditions,

[78] See Zanker 1990 167-192 on the *aurea aetas* in Augustan literature and art.

[79] See Thomas 1982 21-24 for further discussion of the relationship between these poems.

including paradoxographers, who record marvels far beyond anything found in the *HP*.[80] This influence can still be seen in compilers such as Strabo and Pliny, who make use of the Alexander historians (and Theophrastus, in Pliny's case), though often with a disdainful attitude toward their veracity.[81] What these authors do, however, is criticize the earlier sources without adding much new information, and perform their criticism in such a way as to make themselves very much part of the same tradition they decry.

In book 15 of his *Geography*, Strabo takes on the project of writing about India, and he usefully preserves the accounts of many of the Alexander historians on various topics. But by performing this service to future scholars he mires himself in their own worldviews. He makes his contact with India through the medium of the library archive,[82] not from direct contact, yet his objective is to provide a factual account. He displays the best tendencies of Thucydidean history and is disdainful of accounts that seem beyond belief.[83] In book 2, he all but discredits the sources he will use for India:

> ἅπαντες μὲν τοίνυν οἱ περὶ τῆς Ἰνδικῆς γράψαντες ὡς ἐπὶ τὸ πολὺ ψευδολόγοι γεγόνασι, καθ' ὑπερβολὴν δὲ Δηίμαχος, τὰ δὲ δεύτερα λέγει Μεγασθένης, Ὀνησίκριτος δὲ καὶ Νέαρχος καὶ ἄλλοι τοιοῦτοι παραψελλίζοντες ἤδη. (2.1.9)
>
> But all who have written about India have been liars, for the most part. The most extreme is Deimachus, Megasthenes writes the second-worst, and then Onesicritus and Nearchus and all the others of this kind who began to stammer the truth.

[80] For paradoxography in general, see Romm 1992 92, Jacob 1983, and Schepens and Delcroix 1996. Theophrastus' botanical writings appear not to have been a prime source for paradoxographers. However, some of the anecdotes in the *De mirabilibus auscultationibus* attributed to Aristotle can be traced to his minor works *De igne* and *De lapidibus* (Sharples 1988 42) and his *De melle* (Sollenberger 1988 20). For information about the bizarre plants of the east, collections of marvels, such as that provided by Ctesias, were more useful: see Nichols 2011 27-34.

[81] Again, see Romm 1992 94-109.

[82] See Woolf 2011 66-72 on the importance of Rome and its libraries for new ethnography.

[83] See Dueck 2010 237-238 on Strabo's pragmatism and his emphasis on his own travels: autopsy is the best source, though all of his information on India comes from texts.

This is faint praise for Nearchus and Onesicritus, and no praise at all for Megasthenes. Yet in book 15 he happily relates these authors' tales about India,[84] including Onesicritus' conversation with the gymnosophists (15.1.63-65) and other wondrous and bizarre tales. It is clear, then, that Strabo's relationship with his sources is complex, but he is certainly not immune to some of their lapses into end-of-the-earth τόποι and lists of θαύματα. Indeed in discussing the landscape of India, Strabo follows his sources in assimilating India to Egypt and Ethiopia: [85]

> καὶ τοῦτο δὲ τῶν ὁμολογουμένων ἐστὶ καὶ τῶν σωζόντων τὴν πρὸς τὴν Αἴγυπτον ὁμοιότητα καὶ τὴν Αἰθιοπίαν, ὅτι τῶν πεδίων ὅσα μὴ ἐπίκλυστα, ἄκαρπά ἐστι διὰ τὴν ἀνυδρίαν. (15.1.25)
>
> This too is a feature remarked on by those who agree in maintaining the similarity [*sc.* of India] to Egypt and Ethiopia: whatever plains are not flooded do not bear fruit because of the lack of water.

Here India is linked to the other edges of the earth through an explicit use of the geographical τόποι of extreme fertility and its extreme opposite. This is not quite a golden age idea, but it is certainly the product of generalizing and exaggerating rather than of actual investigation into the sources.

Despite his compilation and sorting of sources, Strabo does not have a better idea of the reality of India than those who wrote shortly after the time of Alexander. This is certainly due in part to the general tendency of ethnographers to "make new discoveries harmonize with

[84] "Strabo's confidence in his ability to correct the Indographic writers abruptly wanes ... when, in book 15, he actually undertakes his own survey of India" (Romm 1992 99). Also see 100ff. on the differing fortunes of the authors: Megasthenes is elevated and Onesicritus is demoted.

[85] For more on this comparison, see chapter 4 below.

what was known and believed,"[86] rather than to include new sources of knowledge. Indeed, Strabo explicitly discounts the testimony of merchants who visited India:

> καὶ οἱ νῦν δὲ ἐξ Αἰγύπτου πλέοντες ἐμπορικοὶ τῷ Νείλῳ καὶ τῷ Ἀραβίῳ κόλπῳ μέχρι τῆς Ἰνδικῆς σπάνιοι μὲν καὶ περιπεπλεύκασι μέχρι τοῦ Γάγγου, καὶ οὗτοι δ' ἰδιῶται καὶ οὐδὲν πρὸς ἱστορίαν τῶν τόπων χρήσιμοι. (15.1.4)
>
> The merchants who now sail from Egypt on the Nile and the Arabian Gulf all the way to India rarely have sailed all the way to the Ganges, and they are private citizens and not at all useful for an account of the places.

This dismissal of new sources of knowledge guaranteed that Strabo's account of India would not contain anything truly novel in its account of the lands, plants, and peoples. An example of the kind of source Strabo rejects is the anonymous *Periplus of the Red Sea*, an account in Greek of an Egyptian merchant who visited several ports on the east coast of India.[87] This source dates from the middle of the 1st century CE, but similar accounts would have existed earlier.[88] I discuss the text more fully in terms of its information on Indo-Roman trade in chapter 5, but here it is enough to note that Strabo's rejection of this kind of source is not mere bluster. Rather than reach out to new information coming straight from the source, he prefers to retell the stories of others in much the same way as his predecessors had done, but with a thin coating of critical appraisal and named sources.

A few decades later, the elder Pliny makes use of some of the same sources in producing his encyclopedic *Naturalis historia*, which contains much information about India, its people, and its flora. Many of the details he provides on the plants of the east will be discussed in

[86] Pearson 1960 13; see also Romm 1992 99.

[87] Interestingly, this source itself, though mostly a straightforward account of ports and commodities, is not entirely free of the ethnographic impulse. Once the author reaches India in his account, he refers to the land as πολυφόρος (§41). This could be read as a mere factual statement concerning the production of wheat, rice, sesame oil, and other products in northwestern India, but the emphatic placement of the adjective at the start of the sentence is at least somewhat a nod to the deep-seated tropes of the fertility of India.

[88] See Casson 1989 6-7 on the date, which is now established beyond reasonable doubt.

subsequent chapters in other contexts, but as a general rule, he relies heavily on earlier literary sources, often of the paradoxographical variety,[89] and his references to Indian *mirabilia* do not preserve the scientific assiduity or ethnographical insight of Theophrastus, his main source for this topic.[90] Pliny does not explicitly mention India's plants in his short lapse into paradoxography at the beginning of book 7, though he does mention many of the typical marvels, such as the gymnosophists, the Macrobii, and the Cunocephali.[91] But insofar as plants relate to people, Pliny tells numerous stories throughout the sixteen books of the *NH* that are devoted to plants.[92] But insofar as these plants relate to the east, Pliny is mostly concerned with the relationships Romans of his time have with the plants, rather than the interactions that take place in their native country, and in these cases he generally adopts the stern moralistic attitude of a Cato.[93] Pliny's concerns lie elsewhere than in giving an account of how plants play into ethnography, and, as with Strabo, his work is compiling rather than innovating, so new ideas and theories are not found.

To conclude this brief survey of later authors' Indography, as plants appeared in these ethnographic accounts of India, they were put to less theoretical use. Knowledge about India's flora and the cultural connections its people had with plants does not grow meaningfully after

[89] Lloyd 1983 135ff.; Beagon 1992 8-11 explains his debt to paradoxography in spite of increasing knowledge as being part of Pliny's belief that truth is often stranger than fiction. Beagon 2011 points out that Pliny's investigative gaze is fixed on the earth, and that he views wonder as an excellent stimulant for knowledge.

[90] See Morton 1986 on what Pliny leaves out of his account.

[91] *NH* 7.21: *praecipue India Aethiopumque tractus miraculis scatent. maxima in India gignuntur animalia*. Romm 1992 104-105 comments on the "extremely spare style" of this section of the *NH*, and makes the connection with collections of *mirabilia*, which employ similarly unadorned prose. See also my note above on Pliny's views on the Cunocephali as compared to those of Aelian.

[92] These have sometimes been consciously omitted when modern scholars treat Pliny as a scientist, e.g., by Morton 1986 96. On the other hand, Beagon 1992 202ff. examines in depth Pliny's contradictory attitudes to decadent Greek medicine and natural Roman herbal medicine.

[93] See chapter 5 for Pliny's attitudes to the plant trade.

Theophrastus. His marriage of theory and data is almost anomalous in the ethnographical tradition. The general trajectory of Indography is a downward-opening parabola on the x-axis of time and the y-axis of data: it rises from the golden age myths of Skylax and Hecataeus; passes through the attempts by Herodotus and Ctesias in the 5th and 4th centuries to rationalize and naturalize tales of exotic people, plants, and places from the east; travels through the still more theoretically informed accounts of the Alexander historians; and reaches something of an apex with Theophrastus, in whose writings the naturalistic theories of the development of culture are combined with theories of plant development to present a more complete understanding of the relationship between Indians and their country. After this, one could say graciously that it plateaus in the work of Strabo and Pliny, but that would not be entirely accurate. These writers are more distanced from the India they are writing about than even Herodotus or Ctesias: their India has been frozen in time by Alexander,[94] and the stereotypes and τόποι that still existed in the writers of the late 4th and early 3rd centuries BCE dominate the discussion and block the possibility of an advance in knowledge or understanding. Nevertheless, the persistence of the golden age trope does show us its utility. It provided a mental framework for India that was too convenient to be discarded.[95]

2.4 Conclusion

I close by returning briefly to recent scholarly questions about the definition and the function of ethnography in the ancient Mediterranean world. I have drawn in this chapter on authors who have not generally been considered ethnographers. In particular, Theophrastus' combination of interest in culture and in the nature that produced that culture has given him

[94] See Dihle 1964 for the concept of a "frozen" idea of India in late Republican and early Imperial literature.

[95] See Woolf 2011 112-114 on the functions of stereotypes in (Latin) ethnography.

pride of place and has secured his writings' place in the tradition of ancient Indography. What I hope to have shown is that in the Hellenistic period, authors of Indian ethnography were able to draw upon several paradigms to help them present and theorize about information from the east. This nuanced view of the east shows up in Megasthenes, but it is in Theophrastus' botanical writings that plants from India and the east are presented more clearly than by any other ancient writer. In his text, new data from direct contact with India is filtered through the frameworks of *Kulturgeschichte* and the nature/culture divide.

From this look at the place of plants in Greek ethnography of India, we have seen the persistence of golden age ideas as a way of looking at the east, and how other theories make use of plants to help create frameworks to evaluate different aspects of culture in exotic regions. We have also seen how these theories about cultural history and human development peaked in the Hellenistic period, but then seemingly froze in time, so that Strabo's India differed only slightly from Theophrastus'. But what can we gain from this as students of ancient Greece and Rome? First, I hope to have demonstrated the benefits of a plant's-eye view: Greek and Roman authors write about plants in a way that encodes their perspectives and outlook on the world. Second, I hope to have shown how interactions with native and foreign flora are implicitly and explicitly compared in ethnographies, forging links between Indian civilizations and a mythical golden age or between Indians and primitive Greeks. Finally, I hope to have shown the importance and tenacity of the belief that a golden age lay at the edge of the earth, and how most authors, consciously or not, used this belief as way to filter the new information coming from the east. My focus on India in this chapter has allowed these conclusions to come to light, but the real takeaway is the fruitfulness of this method. Looking at how ancient authors deal with the plants of Libya or Germany or Scythia would be

an equally useful way of examining Greek and Roman interactions with the people who lived in these places.

3 Gardens of Empire[1]

Plants functioned as potent symbols in the ancient Mediterranean world. Their ability to be transplanted over long distances (or to grow from seed far from their native land) was used by various imperial powers to help them express aspects of their rule, particularly its extent and the fertility that resulted from their stewardship of the land. To explore this topic, in this chapter I go beyond "plants in text" to provide useful comparative evidence from the everyday world by analyzing the key development of the royal garden in Greek and Roman contexts. My focus is not on India specifically in this chapter, but rather on the various empires that occupied Mesopotamia and the Near East from Assyrian to Roman times. Royal gardens were near-constant features of eastern imperial powers, though their exact constituents evolved slightly with succeeding empires. Assyrian "botanical gardens" were replaced by Persian pleasure parks, which were then adapted in the late Classical and Hellenistic Greek worlds. But the common connection between these gardens is their importance for expressing the central authority of the monarch or emperor. Though the plants are made to speak a different language, their message is the same: the hegemonic power has control over the land's resources. The goal of this analysis is to see how exotic plants, in particular, were important in these royal gardens, and how the meanings of these plants changed as they were grown far from their native lands in Seleucid and eventually Roman gardens.

Taking a single aspect of these empires—their use of exotic plants in imperial gardens—and exploring its history prior to Alexander, its use by Greeks and Macedonians, and, later, by Romans, is a fruitful way of getting a view of their ideology. The relationship these imperial powers had with plants and the garden provides a useful way to survey the methods and

[1] The chapter is titled after Donal McCracken's book on the botanical gardens of the British Empire.

effects of imperialism. Plants allow rulers to express the extent and productivity of their domain as well as their control over the natural world. Additionally, the use of exotic plant products and the mere presence of the exotic plants themselves grown far from their native soil express the majesty and luxury associated with kingship. Finally, reports in literary sources about the success or failure imperial powers had with growing exotic plants can be used to reflect views the successes and failures of hegemony.

In this chapter, I first survey the history of the garden in the archaic and early Classical Greek world before shifting east to examine the royal gardens of Mesopotamia and Persia. These two strands of influence come together in the gardens of the Seleucids and Romans, along with the growing importance and metaphorical power of exotic plants in more and more globalized ages. I conclude the chapter with case studies of imperial uses of exotic plants: Alexander's lieutenant Harpalus in Babylon, *laudes Italiae* in Virgil and other Latin writers, and a conclusion and excursus on gardens from other empires and how they are and are not similar to their Greek and Roman counterparts. In this chapter, India is not the object of my investigation. Instead, I use it as a source of comparative evidence. Despite its lack of an early tradition of imperial gardens, plants were used by the Mauryan emperor Aśoka to display aspects of his royal beneficence and his devotion to the Buddhist faith.

3.1 Changes in the Greek garden

Even before the arrival of eastern-style gardens, there existed in Greek culture a clear connection between kingship and the fertility of the earth. Though early Greek gardens are generally less well known from archaeological records than Roman or "eastern" gardens, we

can still gain some information about them from literary accounts.[2] Early literary accounts of gardens, such as Alcinous' garden in Phaeacia (*Odyssey* 7.112-131), do not mention exotic plants, but rather describe their extremely fruitful variants of traditionally Greek species.[3]

The connection between the ruler and the garden is even clearer in later texts, for instance, when the concept of a kingly garden is taken in conjunction with Hesiod's description of just cities in the *Works and Days*:

> οἳ δὲ δίκας ξείνοισι καὶ ἐνδήμοισι διδοῦσιν
> ἰθείας καὶ μή τι παρεκβαίνουσι δικαίου,
> τοῖσι τέθηλε πόλις, λαοὶ δ' ἀνθεῦσιν ἐν αὐτῇ·
> εἰρήνη δ' ἀνὰ γῆν κουροτρόφος, οὐδέ ποτ' αὐτοῖς
> ἀργαλέον πόλεμον τεκμαίρεται εὐρύοπα Ζεύς·
> οὐδέ ποτ' ἰθυδίκῃσι μετ' ἀνδράσι λιμὸς ὀπηδεῖ
> οὐδ' ἄτη, θαλίῃς δὲ μεμηλότα ἔργα νέμονται.
> τοῖσι φέρει μὲν γαῖα πολὺν βίον, οὔρεσι δὲ δρῦς
> ἄκρη μέν τε φέρει βαλάνους, μέσση δὲ μελίσσας·
> εἰροπόκοι δ' ὄιες μαλλοῖς καταβεβρίθασιν·
> τίκτουσιν δὲ γυναῖκες ἐοικότα τέκνα γονεῦσιν·
> θάλλουσιν δ' ἀγαθοῖσι διαμπερές· οὐδ' ἐπὶ νηῶν
> νίσσονται, καρπὸν δὲ φέρει ζείδωρος ἄρουρα. (*WD* 225-237)
>
> For those who give straight judgments to foreigners and citizens and do not depart from justice at all, the city thrives and the people in it are in flower. Peace nurtures the young throughout the land, and wide-seeing Zeus never destines painful war for them. Never does famine accompany men of straight judgment, nor does ruin, but they consume in feasting the fruits of their labor. For them the earth bears much sustenance, and on the mountains the top of the oak bears acorns and the middle bears bees. The woolly sheep are heavy with their fleeces, and women bear children that resemble their fathers. They thrive constantly with good things, and they do not go on ships, but rather the grain-giving field bears fruit.

This rich harvest produced by good governance is contrasted with the results of injustice, which include famine, disease, and death. These descriptions of the just and unjust city are followed by solemn advice to kings to think hard on justice (ὦ βασιλῆς, ὑμεῖς δὲ καταφράζεσθε

[2] Carroll-Spillecke 1992b 153. See Schäfer 1992b for an attempt to collect evidence for "non-utilitarian" gardens in the Bronze-Age Aegean.

[3] Alcinous' garden contains pears, pomegranates, apples, figs, and olives, in addition to grapevines. Laertes' garden, as described in *Odyssey* 24, contains mostly the same fruit-bearing plants, but lacks pomegranates.

καὶ αὐτοὶ τήνδε δίκην; *WD* 248-249). The connection is not explicit, but strong nonetheless: as Zeus gives justice in heaven, so do kings on earth, and the result of just earthly kingship will be the flowering city described in lines 225-237.[4] Additionally, historical accounts often attribute the foundation and regulation of gardens to public figureheads. Plutarch reports that Cimon first planted trees in the Athenian agora and in the Academy with Persian spoils (*Cimon* 13), and that Solon's legal reforms included agricultural regulations (*Solon* 24).[5]

In the period following the Persian Wars, contact between the Greeks and eastern empires increased. During this time, it seems the first eastern-style gardens were established in Greece. Xenophon records that following his return he built a park on his estate at Scillus. Pomeroy has likened this to the *paradeisoi* Xenophon saw during his time in Asia.[6] Of course, when he did this, Xenophon did not happen to be a king or satrap, so the import of his action was somewhat different from that of the royal gardens he visited. He was motivated to host festivals and make offerings to Artemis rather than to display centralized control of his domain. In later periods, there is certainly evidence for green spaces in the royal centers of Hellenistic kings. As evidence for palace gardens in the imperial cities of the Hellenistic period, one may cite Polybius 31.29.1-8 on the royal hunting grounds at Pella and Strabo 16.2.6 on the sacred grove at Daphne in Syria. A further suggestion has been made that the peristyle

[4] These evocations of golden age imagery via the garden should be compared with the discussion in chapter 2.

[5] References from Carroll-Spillecke 1992b 154-5 and 161.

[6] For instance, *Anabasis* 1.4.10, 2.4.14, and 5.3.7-13. See also Pomeroy 1994 *ad Oec.* 4.13 and Kawami 1992 92. The park Xenophon built was dedicated to Artemis, however, and he makes no mention of exotic flora, only that he planted a grove of cultivated trees which produced edible fruits in season (ἄλσος ἡμέρων δένδρων ἐφυτεύθη ὅσα ἐστὶ τρωκτὰ ὡραῖα; 5.3.12). The major purpose for the park seems to have been to provide a private hunting ground.

courtyard of the palace at Aï Khanoum was itself a *paradeisos*.[7] To understand these gardens and their importance in the Hellenistic world, we should now turn to their eastern background: the royal gardens of Mesopotamia and Persia.

3.2 Mesopotamian and Persian gardens

The clear predecessors to Greek and Macedonian *paradeisoi* are to be found in the empires that ruled the Near East before Alexander's conquests and the period of Greco-Macedonian hegemony. Thus it is instructive to examine in more depth how plants were used by these previous imperial powers. What comes to light is that the use of the garden, and of exotic plants within that garden, to demonstrate the extent and power of an imperial domain was well entrenched in Mesopotamia and Persia before the advent of Alexander. This tradition dates back at least to the Assyrian period,[8] and it is possible that Assyrian gardens at Nineveh underlie later reports of the hanging gardens of Babylon.[9] The gardens themselves changed in form and content as they were adopted in turn by Assyrians, Neo-Babylonians, and Persians, but, as I argue, a central aspect of the garden remained the same: a statement of the power of the monarch and the extent of his rule.[10]

[7] There is a possible methodological difficulty here in grouping parks and courtyards together under the heading "garden." I attempt to sort this out below.

[8] See Fauth 1977 for an attempt to trace palace gardens back to the Sumerian period.

[9] As is suggested in Dalley 2013. See also below.

[10] This, I believe, is more than an obvious claim. Though the connection between kings and gardens is widely recognized in modern literature, the nature of the connection is often thought to have changed between empires: Assyrians tried to create empires-in-miniature, whereas Persians created models of the universe and aspired to a more divine form of kingship, and also provided a space for hunting. But the similarities and the continuities between these cultures are often ignored when discussing the Achaemenids and later rulers. As I will argue, the *paradeisos* remained a place to showcase the fertility and extent of the empire under the Achaemenids and beyond.

It is clear that for the early inhabitants of Mesopotamia gardens had more than a commonplace significance. Much of this significance can be traced to the relationship these peoples had with water. The importance of water in the dry climate of the Near East led to the paradise myth, in which the god Enki brings water to the desert, creating a divine garden similar to the Garden of Eden.[11] This led to the special place of the garden for the Babylonians and Assyrians, as it is characteristic of these gardens that they are well watered and provide shade.[12] These gardens were economically important, producing fruits and, especially, garlic,[13] and would have provided pleasant spaces for the imperial elite.[14] This situation remained into the Neo-Babylonian period (626-539): Nebuchadnezzar and other rulers modeled new garden construction on Assyrian predecessors.[15] The Persians, however, were not natives of Mesopotamia, coming rather from the Iranian plateau, an even more infertile and inhospitable place, before establishing palaces complete with expansive gardens.[16] For them, then, the garden had additional importance: it represented their transition from steppe nomads to a settled "river culture."[17] The Persians also drew on Elamite influences, including the

[11] Moynihan 1979 2-7; Stronach 1989 475-6.

[12] Margueron 1992 51-55.

[13] Margueron 1992 56; 60. Margueron believes that the economic function of these gardens was primary: that the *Wirtschaftgarten* preceded the *Lustgarten*. Nevertheless, the attribution of a sole primary purpose to these gardens is going too far. The gardens served multiple roles, one of which was certainly the production of economically valuable fruit and vegetables.

[14] Lumsden 2001 34-5, 44 argues that the establishment of new cities in the 9th century by Assurnasirpal II led to a new elite that was isolated from the common people. This elite class would be the frequenters of any pleasure gardens.

[15] Kuhrt 2001 82-83.

[16] Moynihan 1979 14; Kawami 1992 81.

[17] Fauth 1977 2. Kawami 1992 88, on the other hand, believes that the original Achaemenids were already a settled people, and the their nomadism is an invention of the Greek historians.

importance of the *soma* plant in their religion.[18] In all these traditions, then, the garden had importance for royal ideology.

An interesting contrast to the ubiquity of the royal garden in Iranian and Mesopotamian cultures is the lack of a corresponding tradition in India before the Mughal period.[19] I make this claim despite descriptions in Greek and Latin literature of the palace of Chandragupta, as I view these to be spurious. Moynihan (1979 88), however, accepts McCrindle's attribution of Aelian *De natura animalium* 13.18 to Megasthenes.[20] The passage is a lavish description of the palace at Pataliputra, which ostensibly includes tame peacocks, fishponds, and trees of all kinds:

> ἐν δὲ τοῖς παραδείσοις τρέφονται μὲν καὶ ταῶς ἥμεροι καὶ χειροήθεις φασιανοί ... τὰ δένδρα αὐτὰ τῶν ἀειθαλῶν ἐστι, καὶ οὔποτε γηρᾷ καὶ ἀπορρεῖ τὰ φύλλα· καὶ τὰ μὲν ἐπιχώριά ἐστι, τὰ δὲ ἀλλαχόθεν σὺν πολλῇ κομισθέντα τῇ φροντίδι, ἄπερ οὖν κοσμεῖ τὸν χῶρον καὶ ἀγλαΐαν δίδωσι, πλὴν ἐλαίας· οὐ γὰρ αὐτὴν ἡ Ἰνδῶν φέρει, οὔτε αὐτή, οὔτε ἤκουσαν ἀλλαχόθεν τρέφει.
>
> In the *paradeisoi* tame peacocks are raised and domesticated pheasants ... the trees there are of the evergreen type, and their leaves never age and fall off. And while some trees are native, others with much care have been imported from elsewhere, and these beautify the land and provide it with adornment; except the olive tree, since the Indian soil does not grow it, neither naturally nor when brought from elsewhere.

There is nothing to tie this description to India besides a later mention of the Βραχμᾶνες, and it is likely that Aelian or his source has grafted a description of a Persian palace garden onto India.[21] The singling-out of the olive as a tree that does not grow in India is interesting, based on the discussion in the previous chapter. The two alternatives Aelian mentions (that the tree

[18] Kawami 1992 82-87. Kawami also attributes to Elamite influence the stories in Herodotus (7.27, 7.31) about Xerxes and two golden plane-trees (1992 90).

[19] Moynihan 1979 88 hypothesizes that the more productive natural environment of India made it less likely for a tradition of royal gardens to develop.

[20] McCrindle 1901 142n1 says that Aelian's account is "most probably copied from Megasthenes." Jacoby does not attribute this passage to Megasthenes in *FrGH*, nor does *BNJ*.

[21] Note also that Theophrastus reports that olives grow in regions of India (*HP* 4.4.11, discussed in chapter 2).

grows neither naturally nor when brought in from elsewhere) say different things about the Indians. In the first case, there are implications for India's failure to achieve high levels of civilization (viewed from a Greek perspective, of course) despite its hypertrophy, whereas in the second case, Aelian could simply be making a reference to different plants' preferences for different environments. Flora and fauna, or at least decorative elements based on these, are also mentioned in Quintus Curtius' description of the palace:

> regia auratas columnas habet: totas eas vitis auro caelata percurrit aviumque, quarum visu maxime gaudent, argenteae effigies opera distinguunt. (8.9.26)
>
> The palace [of the Indian king] has gilded columns, and a vine engraved with gold runs around its whole perimeter, and the structure is adorned by silver statues of birds, and the Indians very much enjoy gazing at these.

Here too there is nothing that ties this description closely to other accounts of India, so the passage is a likely romanticization in the tradition that leads to the Alexander Romance.

In contrast to these accounts of India, the importance of the royal garden in Persia and Mesopotamia stands out more clearly. But what plants would be included in the king's garden, and how would these help express concepts of kingship? Here we must acknowledge the question of the changing nature of the garden under different regimes.

In the Assyrian period, the garden seems to have been a collection of exotic plants from across the realm, a concept not entirely dissimilar from the modern botanical garden. These palace gardens, e.g., at Ugarit, take up most of the open space at the palace, but for the most part, the plants they contained are unknown.[22] We do have one good source, however, for the plants one of these gardens contained. This comes from a stele of the king Assurnasirpal II (reigned 883-859) found at Nimrud. This mentions 42 varieties of trees from various regions of the king's realm, "from the lands in which [he] had traveled and the mountains which [he] had

[22] Margueron 1992 72-73.

passed."[23] This royal garden is a statement of the king's power over the natural world. As Stronach (1990 171-2) interprets, Assurnasirpal's "clear association with [fruitfulness] may have been meant to underline another aspect of the monarch's public persona: namely, his cosmic role in assuring the fertility and fruitfulness of the land as a whole." Sennacherib, Sargon, and Assurbanipal also had significant royal gardens, and it seems that Sargon's park contained artificially raised areas, planted with Syrian trees, to resemble the trees' native land and display his dominance of it.[24]

Dalley 2013 has proposed that the tale of the hanging garden of Babylon, reported in several Greek and Roman authors of the imperial period,[25] was actually transferred to Babylon, and that the story was originally based on the gardens of Sennacherib in Nineveh, which are described in the Chicago Prism of Sennacherib:

> I [Sennacherib] raised the height of the surroundings of the palace, to be a Wonder for All Peoples. I gave it the name "Incomparable Place." A high garden imitating the Amanus mountains [which divide Cilicia from Syria] I laid out next to it, with all kinds of aromatic plants, orchard fruit trees, trees that enrich not only mountain country but also Chaldaea, as well as trees that bear wool, planted within it. (translation from Dalley 2013 63)

[23] For discussion and translation see Wiseman 1952 27-8. The quoted passage is from Wiseman's translation of lines 40-41 of the stele. Wiseman believes that the botanical interest of Assurnisarpal was the impetus for future kings' pleasure gardens. However, the king's interest in exotic flora specifically implies a centralizing tendency: as the control of the land is centralized in the person of the king, thus the agricultural and botanical production of the land is centralized in the garden. Stronach (1989 476-7; 1990 171-2) emphasizes the practical fruitfulness of the garden and the king's connection with fertility over the garden's association with the extent of the king's realm.

[24] Margueron 1992 71-73; Stronach 1990 172. Sennacherib's garden at Assur was likely the model for Assurnassirpal's at Nimrud. Dalley 2013 61-105 discusses the technological innovations involved in Sennacherib's garden.

[25] See Dalley 2013 29-41 for a summary of the classical sources for the garden.

It is true that there is no good evidence for the actual presence of a hanging garden in the city of Babylon,[26] and Dalley's conclusion may be correct. Nevertheless, the *story* of the Babylonian gardens served a useful purpose in Hellenistic Greek historiography, displaying the cultural communication between Babylonians and Greeks as Berossus reacted to Clitarchus' account of King Nebuchadnezzar's homesick wife.[27] Even these legendary gardens were built upon the fixed notion of the Babylonian pleasure garden, which was certainly a real feature of ancient Mesopotamia.

A slightly different kind of garden, which we can call by the Greek name *paradeisos*, appears when we turn to the Persian period. At this time, gardens were not solely connected with the elites, and in fact they were present in the houses of commoners as well as in palaces.[28] Nevertheless, the symbolic importance of the garden is best seen in its most monumental form: the Achaemenid palace garden. These gardens are in some senses departures from those of the Assyrians and Babylonians. Persian gardens appear to have been more park-like, and to have been intended to serve for recreation, education, and relaxation as much as for the actual production and growth of plants and fruit. The *paradeisos* complex at Pasargadae, built by Cyrus I, which was surrounded by palace buildings and contained pavilions for the use of the kings and his visitors, is indeed a break from previous

[26] Dalley 2013 13-27 recounts numerous attempts to find the hanging garden in Babylon. Kuhrt 2001 82 reports that though evidence of *hanging* gardens cannot be found there, there is much evidence of garden-variety gardens. Reade 2000, by surveying a list of various Babylonian archaeological sites and discussing the evidence for cultivation of gardens in Babylon under the Persians and Assyrians, directly supports the ubiquity of gardens in Babylonian city architecture, whether or not either Kasr or Babil actually housed the legendary hanging garden. See also Stronach 1990 174 who attributes to Nebuchadnezzar the desire to create "a form of royal garden that would proclaim the same proud message" of the "unrivalled condition of his rule."

[27] Haubold 2013 165-166 and 172-176. Haubold shows how Berossus' story displays how both "Nebuchadnezzar could build Iranian-looking gardens" and "Berossus could write a Greek history of Babylon for the new Seleucid rulers" (176).

[28] Moynihan 1979 11.

Mesopotamian traditions: "the garden itself became the royal residence."[29] This fact is further brought out by architectural designs that involve vegetative iconography.[30] An additional difference between Achaemenid and Mesopotamian gardens is displayed by the use of the Persian *paradeisos* for hunting.[31] Xenophon mentions *paradeisoi* specifically as places for hunting several times in the *Cyropaedia* (1.3.14, 1.4.5, 1.4.11, 8.1.38, and 8.6.12).[32] There was a long tradition of using the royal gardens and grounds for training noble youths in hunting and gardening, as Strabo recounts:

> θηρεύουσι δὲ σαύνια ἀφ' ἵππων βάλλοντες καὶ τοξεύματα καὶ σφενδονῶντες. δείλης δὲ φυτουργεῖν καὶ ῥιζοτομεῖν ἀσκοῦσι καὶ ὁπλοποιεῖν καὶ λίνα καὶ ἄρκυς φιλοτεχνεῖν. οὐχ ἅπτονται δὲ τῶν θηρευμάτων οἱ παῖδες, ἀλλὰ κομίζειν οἴκαδε ἔθος. (15.3.18)
>
> They hunt by shooting javelins and arrows from horseback and by using slings. In the afternoon [the noble youths] practice gardening and gathering roots, and making weapons and in crafting linen cloths and nets. They do not touch the spoils of the hunt but their custom is to bring them home.

In this way two aspects of the ideal Persian king, hunter and gardener, can be trained in the *paradeisos*.[33]

But these gardens did not completely shed the exotic aspect of the earlier Assyrian garden. Haubold has shown how the imperial geography of Sargon was influential for the Achaemenid worldview,[34] referencing the "Babylonian World Map" tablet.[35] And despite the

[29] Stronach 1989 480.

[30] Kawami 1992 90.

[31] It is often thought that animals were a standard part of Persian *paradeisoi*, but clear evidence for their inclusion comes only from Greek sources and from the much later Sassanian period. See Kawami 1992 96.

[32] The first three references are to the *paradeisos* of the Median king Astyages, Cyrus' grandfather.

[33] Fauth 1977 4-5.

[34] Haubold 2013 102ff.

emphasis in Greek sources on hunting and manly virtue in the *paradeisos*, the garden was primarily a location for plants. Moynihan speculates that the garden at Pasargadae would have included pomegranate, vine, sour cherry, lilies, and irises, among other plants.[36] When we attempt to discover more definitely what plants were contained in Persian gardens, we can turn to an Elamite tablet from Persepolis (reign of Darius I)[37] that contains a long list of fruit seedlings to be planted in the Persian king's various gardens at spots around Persepolis, and also notes the distribution of caretaking duties for those gardens. The identifications of some Elamite tree names are uncertain, but olive, apple, pear, quince, and date seedlings are mentioned. Among familiar Mediterranean plants, a major omission is the grapevine, though some plants are unidentified (*karakur*, *silti*, *kazla*, and *kamma*). A notable inclusion is the olive, a Mediterranean plant that would represent Asia Minor, the western frontier of the king's empire.

This aspect of the Persian garden should be compared with other representations of the vastness of the empire in inscriptions and in artwork.[38] Here it often came in the guise of a listing of exotic products and peoples. For instance, the trilingual foundation charter for the palace of Darius I at Susa refers to cedar wood from Lebanon, gold from Lydia and Bactria, and wall decoration from India, among other luxury items.[39] Several other texts in Elamite and

---

[35] British Museum BM 92687. The tablet contains a schematic map of the world on the obverse and a list of places on the reverse. See Haubold 2013 107-109 for the importance of this document for Persian conceptions of imperial space.

[36] Moynihan 1979 18-19.

[37] Pfa 33, in Kuhrt 2007 510-511.

[38] See Stronach 2001 on important differences between the imperial art and architecture of Cyrus, Cambyses, and Darius.

[39] DSf, translation in Kuhrt 2007 492-5.

Akkadian contain similar lists of the various imported materials used in the palace.[40] With this written expression in inscriptions can be compared the depiction in art of throne-bearers dressed in the traditional garments of the various regions of the empire.[41] In both cases, the products and peoples from the periphery of the empire are brought to the middle in order to display the centralization of power and the vastness of the empire.

This presentation of periphery and center goes beyond the self-conscious "foundation" genre of texts and art. Plants played a large part in symbolizing the hegemony and diversity of the Persian realm, beyond their mere inclusion in lists of raw materials for the building of palaces. This symbolization took place in the royal garden. For instance, the trilingual inscription of Artaxerxes II at Susa refers to his new palace as if it were entirely a garden for the king's pleasure:

> I am Artaxerxes, the great king, king of kings, king of peoples, king on this earth, son of Darius, the Achaemenid. Artaxerxes the king proclaims: By the favour of Ahuramazda I built this palace in my lifetime as a pleasant retreat (*paradayadam*). May Ahuramazda, Anahita, and Mithra protect me from all evil and what I have built.[42]

The word used to refer to the palace retreat, *paradayadam*, is the same word that describes pleasure-gardens, and is the word that is transformed into παράδεισος in Greek texts that discuss the gardens of eastern monarchs.[43] A royal garden of this sort was a conspicuous use of

---

[40] DSz and DSaa in Kuhrt 2007 495-497. DSaa is particularly important, because, instead of listing the origin of each material, it balances a list of exotic materials ("gold, silver, lapis lazuli, turquoise, carnelian, cedarwood, Maka-wood, ebony, ivory, and the decoration of the reliefs") with a list of parts of the realm ("Persia, Elam, Media, Babylon, Assyria, Arabia, the sealands, Sardis, Ionia, Urartu, Cappadocia, Parthia, Drangiana, Areia, Chorasmia, Bactria, Sogdiana, Gandara, Cimmeria, Sattagydia, Arachosia, Qadie"). This shows the emphasis given to the *extractive* nature of Persian hegemony; a list of territories is equivalent to a list of raw materials that are ripe for exploitation by the king in his creation of monumental architecture.

[41] Briant 2002 173-178.

[42] A^2Sd, translation from Kuhrt 2007 403-5. Stronach (1989 484) describes how this garden of Artaxerxes' echoes the design of Cyrus' garden at Pasargadae.

[43] "There can be no longer any doubt" about the linguistic connection, per Briant 2002 422. Stronach (1989 491n61) believes that the Persian gardens might not be the same as the Greek *paradeisoi*, and that the term

resources by the king: it required a wide expanse of land, as well as irrigation and the service of gardeners. And beyond its mere existence marking the prestige of the king, the choice of plants inside it was used to express concepts of empire.

The contents of a Persian royal garden would have been vast and impressive: a true "microcosm of empire."[44] In Xenophon's *Oeconomicus*, Socrates reports on how the Persian king inspects his territories: first he examines their military preparations (4.5-4.7) and then their agricultural produce (4.8-14). Here, Critobulus comments that the *paradeisos* must be full of "trees and all the other beautiful things that the earth produces" (δένδρεσι καὶ τοῖς ἄλλοις ἅπασι καλοῖς ὅσα ἡ γῆ φύει; 4.14).[45] The king's garden therefore represents the fertility and productivity of all the lands under his control. Further, the paradigm of "king as gardener" is emphasized by *paradeisoi*.[46] Xenophon reports that Cyrus the younger planted some of the trees himself in his *paradeisos* at Sardis,[47] and iconography of the king plowing was common in the Persian period, as well as earlier.

Another element of these gardens that deserves mention is their orderliness. When compared to the natural environments of the Achaemenid Empire that are represented therein, be they lush and fertile or barren and desert, the gardens were tidy, well cared-for, and demonstrated the king's ultimate "control over space."[48] Xenophon's Socrates discusses

---

paradeisos refers rather to a park than a garden. Nevertheless, it seems that the Greek word simply had a wide semantic range that covered both animal parks and ordered gardens.

[44] Kuhrt 2007's term for representations in miniature of the extent and power of the Persian Empire.

[45] At *Hellenica* 4.1.15, Xenophon refers to Pharnabazus' *paradeisos* at Dascleium, which appears to have been primarily an enclosed hunting park.

[46] Fauth 1977.

[47] *Oec*. 4.22. The emphasis here is on the king's hard work producing a good outcome for his empire.

[48] Briant 2002 200-202.

the Persian king's garden as a macrocosm of an ideal Athenian οἶκος, in terms of its order and the control over nature it demonstrates,[49] and, indeed, the remains of the Persian garden at Pasargadae display a remarkable system of irrigation and design.[50] There is also the idea that the garden at Pasargadae had a layout with four quadrants which would represent the four corners of the world.[51]

A final function of the royal gardens of the Achaemenids is in the transportation of plants across the empire. Here, the rulers engaged in horticulture partly for economic reasons, though the hegemonic aspect of their actions was more significant. This is true also in the case of modern European empires, as I will discuss at the end of this chapter.[52] But for the Achaemenids, transportation of plants primarily displayed mastery over the natural landscape and a tendency to bring the periphery of the empire to the center, at least in terms of its flora. A Greek inscription from Magnesia on the Meander, which purports to be a letter of Darius I to Gadates,[53] shows the king's appreciation for his satrap's ability to control the natural landscape over which he rules:

> ὅτι μὲν γὰ[ρ] | [τ]ὴν ἐμὴν ἐκπονεῖς [10] [γ]ῆν, τοὺς πέραν Εὐ|[φ]ράτου καρποὺς ἐπ[ὶ] | τὰ κάτω τῆς Ἀσίας μέ|[ρ]η καταφυτεύων, ἐπαι|[ν]ῶ σὴν πρόθεσιν καὶ [15] [δ]ιὰ ταῦτά

[49] See Pomeroy 1994 *ad Oec.* 4.5, who notes that this idea of order becomes an aesthetic appreciation in the later dialogue with Ischomachus, e.g. at 8.19-20: ὡς δὲ καλὸν φαίνεται, ἐπειδὰν ὑποδήματα ἐφεξῆς κέηται, κτλ. This concept of the aesthetic ideal of the ordered field is taken up in Columella, who compares the beauty of a perfectly ordered and organized vineyard to a Platonic form (3.20.4-5).

[50] See Moynihan 1979 15-18, Stronach 1989 480-3, and Stronach 1990 174-6 for descriptions and plans of the garden's architecture.

[51] Fauth 1977 2, citing Sackville-West; also Stronach 1989 482-3; 1990 176.

[52] Brockway 1983 cites examples of seed transfer and plant-product monopolies in the European colonial empires in Africa and South and Central America: "In the eighteenth and nineteenth centuries, botany was the ally of the expanding European empires" (31-32).

[53] Rostovtzeff 1941 1163 has no doubts about the authenticity of this inscription. More recently, Hansen 1986 has argued against and Wieshöfer 1987 for its authenticity. Kuhrt 1995 699 uses the inscription with no qualms as to its authenticity.

> σοι κείσεται | μεγάλη χάρις ἐμ βασι|λέως οἴκωι. (*SIG*[3] 22; Hadrianic reproduction of original from ca. 490 BCE)
>
> Because you are working at my land by transplanting fruit trees from beyond the Euphrates into the lower parts of Asia, I praise your purpose and because of this, great gratitude will be in store for you in the king's house.

In the inscription, Darius praises Gadates for his success in importing plants to Caria, on the western frontier of his empire.[54] But as Kuhrt notes, this transplantation was not undertaken on Gadates' initiative: "the imperial grip on productive resources was tight," and any relocation of valuable seedlings would have been orchestrated by the imperial authorities.[55] Thus, in contrast to the exploits of Tissaphernes and Harpalus (as discussed below), this inscription records an act that is essentially royal, although it is carried out by a provincial official. This transplantation also demonstrates the center-periphery model, since again it is the plants from the east that are being moved, via the center of the empire, to the western frontier.

3.3 Exotic plants in the Seleucid Empire

With this background, we can begin to examine how the Seleucids interacted with plants and the concept of the royal *paradeisos* in their empire. In Mesopotamian thought, there was a single line of kingship that passed on from one ruler to another, regardless of regime change.[56] Thus the Seleucids were the direct heirs of the gardens of Assurnasirpal, and their attitudes and behavior toward the ancient customs of their new empire would be expressed

[54] The precise source of these plants is not specified. If πέραν Εὐ|[φ]ράτου is stated from Darius' point of view, it would presumably refer to the province of Ebu-nari (Syria; literally, "across the river"). However, if this is said in reference to Gadates, then a larger movement from the east to the west of the empire is being reported. In either case, the movement is from one frontier region of the empire to another.

[55] Kuhrt 1995 700.

[56] Haubold 2013 163.

through their use of imperial gardens. A passage from Strabo provides a useful illustration of the attitudes the Greco-Macedonian colonists had toward the environment when they began settling their new kingdom. Though the land was remarkably fertile, it still required some expense of effort on the colonists' part to force it to produce a proper Greek harvest of grapes:

> πολύσιτος δ' ἄγαν ἐστὶν ὥστε ἑκατοντάχουν δι' ὁμαλοῦ καὶ κριθὴν καὶ πυρὸν ἐκτρέφειν, ἔστι δ' ὅτε καὶ διακοσιοντάχουν.... τὴν δ' ἄμπελον οὐ φυομένην πρότερον Μακεδόνες κατεφύτευσαν κἀκεῖ καὶ ἐν Βαβυλῶνι, οὐ ταφρεύοντες ἀλλὰ παττάλους κατασεσιδηρωμένους ἐξ ἄκρων πήττοντες, εἶτ' ἐξαιροῦντες, ἀντὶ δ' αὐτῶν τὰ κλήματα καθιέντες εὐθέως. (15.3.11)
>
> [Susis] produces so much grain that both barley and wheat on average yield one hundred-fold, and there are times they yield two hundred.... The grapevine did not grow before the Macedonians planted it, both there and at Babylon, [and this was] not by trenching, but by inserting iron-tipped stakes, then removing them and immediately planting the slips in their place.

Rostovtzeff believes that Strabo here has "misunderstood his good and trustworthy source," since "we know with certainty that vines were cultivated in Babylonia and Assyria."[57] But regardless of whether Rostovtzeff is correct about Strabo originating the error, this account displays the settlers' attitude toward an aspect of their heritage: by planting this quintessentially Greek plant in the chief city of a foreign land, they are asserting their control of the land's natural processes and their subjugation of the very soil underfoot. They are asserting dominance over the land itself, much as they had over its inhabitants.

But the *paradeisos* lost some of its meaning in the transition from east to west, and thus these institutions remain distinct from Near Eastern *paradeisoi.*[58] The gardens served various

[57] Rostovtzeff 1941 1164. Rostovtzeff compares the introduction of European plants into Babylon to their introduction into Egypt, and cites this as a "similarity between Egypt and the Seleucid kingdom" (1165). Additionally, Posidonius (*BNJ* 87 F 68 = Athenaeus 1.28d) says that the Persians introduced cultivation of the vine to Damascus in Syria. This would imply that vines grew in the Persian homeland before being introduced to the eastern edge of their empire.

[58]Carroll-Spillecke 1992b 171 emphasizes the economic potential of these gardens, rather than their other possible functions: "Sie [paradiesgärten] sind keineswegs als königliche Lustgärten zu verstehen, sondern aus Obstplantagen und Baumgärten bestehende reine Nutzanlagen." A hint that the Seleucids had more traditional

purposes for those who enjoyed them—service to the gods, breeding wild game for the hunt, or both in the case of Xenophon's park—but they do not successfully serve the distinct purpose of the Assyrian, Babylonian, and Achaemenid *paradeisoi*: the accumulation and display of plants from the various regions under royal control. These gardens were found throughout the Hellenistic world, within and without the Seleucid Empire. The new cities founded by Alexander's successors were highly planned, and private space was tightly controlled: public and royal gardens were thus all the more important places for projecting the power of the court.[59]

Nielsen has grouped Hellenistic palace gardens into three categories, which she associates with certain Greek terms: fenced park (*paradeisos*), walled enclosure (*kêpos*, *alsos*, or *gymnasion*), and peristyle courtyard.[60] She then traces these gardens to Achaemenid, traditional Greek, and Egyptian influences, respectively.[61] This neat division may be useful for a survey of archaeological remains, but the textual evidence does not break so evenly. The term *paradeisos*, in particular, is used with broad reference. Additionally, the assignment of one specific strain of influence to each type of garden is admirably simple, but also misguided. Hellenistic courts drew on their entire cultural background when creating their palace gardens, and were not subject to this kind of compartmentalization of influences.

---

paradeisoi that involved transfer of plants across the empire comes from Theophrastus, who states that certain European trees, boxwood (*Buxus*) and linden (*Tilia*), had difficulty growing in the regions conquered by Alexander: καὶ γὰρ περὶ ταῦτα πονοῦσιν οἱ ἐν τοῖς παραδείσοις (*HP* 4.4.1). In this case, though, the plants are being imported are from the homeland of the rulers, not from the foreign territories under their control.

[59] Carroll-Spillecke 1992b 166.

[60] Nielsen 2001b 165-167. Her *paradeisoi* include the Basilea at Alexandria, that of the Seleucid palace at Antioch, and the "park" at Aï Khanoum. For *kêpoi*, she lists the palaestra at Alexandria and the gymnasium at Aï Khanoum.

[61] Nielsen 2001b 167-181. For peristyle gardens, she relies on the evidence of 2nd century BCE Roman houses near the Bay of Naples, which she traces to Hellenistic models.

Not all plant transfer was successful for the Seleucids. Pliny reports that Seleucus I did not have good luck when he tried to import living plants from his eastern frontier:

> non habet vires frutex cinnami in Syriae vicina perveniendi. non ferunt amomi nardique deliciae, ne in Arabiam quidem, ex India et nave peregrinari; temptavit enim Seleucus rex. (*NH* 16.135)
>
> The shrub of cinnamon does not have the strength to make it in the neighborhood of Syria. Amomum and nard, those delights, do not endure traveling to Arabia from India, even by ship: for King Seleucus did make an effort.

Thus, in contrast to Persian successes (such as those of Gadates), Seleucus is unable to import these plants to his garden and thereby display his dominance over the natural world. Though his failure is likely due to the plants' fragility during travel, it reflects on the wider issue of how his rule was conceived in Pliny's source. Sherwin-White and Kuhrt consider this kind of transport of plants to be an aspect of the Seleucid kings' attempts to "foster economic growth."[62] While this is true, its significance has been exaggerated by comparison with European colonial empires, which engaged in resource exploitation in a much more thorough and dominating way.[63] In this case, the real significance of Seleucus' action is his attempt to mirror the gardens of the Achaemenids. If he had succeeded in growing plants from the borders in the heartland of his empire, he would have been engaging in the same behavior as the Achaemenid kings before him: bringing the periphery to the center and thereby uniting the empire through a display of the king's power over the natural environment. That Pliny's source reports on his failure shows how Seleucus' rule was not perceived to have the same control over the natural world that was exercised by the Persian kings before him.

[62] Sherwin-White and Kuhrt 1993 70.

[63] There is no evidence the Seleucids engaged in resource transportation and imposition on the scale of the coffee and rubber plantations instituted in Africa and South American by European colonial powers. See below.

By this negative example I do not mean to imply that Seleucid kings were completely unsuccessful in using plants to project power.[64] Even though Seleucus was reportedly unable to import *live* exotic plants, he was certainly able to import the more travel-tolerant products that were derived from them: incenses and spices, for instance. These luxuries are listed as part of a long list of dedicatory offerings to the temple of Apollo at Didyma:

> [10] βασιλεὺς Σέλευκος Μιλησίων τῆι βουλῆι | καὶ τῶι δήμωι χαίρειν. ἀφεστάλκαμεν εἰς τὸ ἱερὸν τοῦ Ἀπόλλωνος τοῦ ἐν Διδύμοις | ... | λιβανωτοῦ τάλαντα δέκα, σμύρνης | τάλαντον ἕν, κασίας μναῖ δύο, κινναμώ[60]μου μναῖ δύο, κόστου μναῖ δύο. (*OGIS* 214; 288/7 BCE)
>
> King Seleucus greets the council and people of the Milesians. We have dispatched to the temple of Apollo in Didyma ... 10 talents of frankincense, 1 talent of myrrh, 2 minas of cassia, 2 minas of cinnamon, 2 minas of *kostos*.

In this case, the king's dedication of immense amounts of exotic plant products (alongside gold and silver vessels) displays his wealth as well as his cultural dominance: he offers the products of a foreign land to a Greek temple located on the Aegean, part of the distant "homeland," as it were, for the Greeks in the east. Nevertheless, this kind of gesture differs from the Persians' bringing live exotic plants to the center of an empire. In this case the plant products are sent to a cultural hub of the dominant Greco-Macedonians that is exterior to the imperial territory, and thus the offering emphasizes the lack of a central node within the Seleucid Empire.[65] The cultural center of the Seleucid Empire remained the Aegean world of Macedonia and Greece,

[64] Indeed, it is assumed that the Seleucids took good care of former Achaemenid gardens: "die gärten und Lustparks der Achämenidenkönige wurden ... unter den makedonischen Herrschern ... weiter gepflegt" (Kawami 1992 93).

[65] Perhaps, though, this gesture presages Seleucus' seizure of Asia Minor from Lysimachus I. By the act of dedication Seleucus may be exerting a claim on the territory; he treats Asia Minor as if it is already a frontier territory of his empire.

and thus the concept of center-and-periphery cannot be pushed too far for the Seleucid Empire.[66]

The presence of amphorae of imported olive oil at the archaeological site of Aï Khanoum in Bactria presents a nice parallel (in reverse) to Seleucus' use of imported spices as an offering to Apollo.[67] This oil must have been imported from the Mediterranean, and, at the most basic level, it is a testament to the luxury enjoyed by the inhabitants of the palace at Aï Khanoum. But more symbolically, considering the importance of the olive for Greeks, the oil is an unmistakable statement of Greek identity, which is to be taken together with the gymnasium and the theater as elements of Greekness in the frontier city. The process of Seleucus' dedication is played out very nearly in reverse: a Greek product is brought from the Mediterranean to the edge of the empire. It must also be noted that the presence of this olive oil in Bactria is very different from the presence of olive trees in the orchards of the Persian king (see above). The olive takes on a special significance in Aï Khanoum, first because of its connection with the Greek identity of the colonists, and second because the tree cannot grow in Bactria, but only the finished good can be imported to the edges of the Seleucid Empire.

In sum, the transport of plants into and out of the empire reflects several aspects of the imperialism of the Seleucids. Their inheritance from the Achaemenids of the *paradeisos* as an element of a center-and-periphery model of empire can be seen in Seleucus' attempts to grow Indian plants in his territory. However, Strabo's story about planting vines in Susa, the offering to Apollo at Didyma, and the olive oil at Aï Khanoum display the fundamental

[66] Seleucus' dedication can be compared with the lengthy account from Callixinus of Ptolemy II Philadelphus' procession (*FGrH* 627 F 2 = Athenaeus 5.196A-203B). This included many plants, plant products, and representations of plants, including ivy (see below), grapevine, Egyptian *persea* (see chapter 4), and massive amounts of spices. Unfortunately, we do not learn which kinds of trees were carried, decorated with animals and birds: ἄνδρες ἑκατὸν πεντήκοντα φέροντες δένδρα, ἐξ ὧν ἀνήρτητο θηρία παντοδαπὰ καὶ ὄρνεα (Athenaeus 201B).

[67] Bernard 2008 93.

difference between the Seleucid and Achaemenid Empires. The Greco-Macedonians were conscious of their connection to the Aegean homeland, and this is shown through the importation and establishment of essential Greek plants and products (the grapevine and ivy) and in the displays of power and exoticism that are directed toward a temple located exterior to the empire. Perhaps the story of Seleucus' lack of success in growing nard and amomum, reported in Pliny's source, is intended not to simply demonstrate his gardener's lack of a green thumb or the fragility of these exotic plants, but rather the perceived failure of Seleucus to create a stable imperial center, complete with requisite gardens full of exotic flora, in the way that the Achaemenids had done before him.

3.4 Case studies

I conclude with case-studies of the imperial use of plants. These will, I hope, show how ivy served as a symbol of imperialism in the eastern regions of the Hellenistic world (in the case of Harpalus), how eastern traditions were adopted by the later imperial power of Rome (in the case of the *laudes Italiae*), and how other empires used plants in ways similar to and different from the Greeks and Romans.

3.4.1 Harpalus and ivy

Harpalus is well-known for his plundering of Alexander's treasury at Babylon and his subsequent flight to Athens. But prior to this, perhaps in a calmer period of his life, he engaged in some gardening in Babylon. The earliest source for this story is Theophrastus' *Historia plantarum*, from which it is cited by Pliny the Elder. Plutarch tells the story twice, in his *Table-Talk* and *Life of Alexander*. A survey of these four versions of the story and the changes

that creep into the tradition will give insight into the importance of gardens (and ivy) for the projection of imperial power.

The other versions all are based on Theophrastus' anecdote, which is given in book 4 of the *HP* when he is discussing which plants are able to grow in which locations in Asia:

> ἀλλ' ἐν Ἰνδοῖς φανῆναι κιττὸν ἐν τῷ ὄρει τῷ Μηρῷ καλουμένῳ, ὅθεν δὴ καὶ τὸν Διόνυσον εἶναι μυθολογοῦσι. δι' ὃ καὶ Ἀλέξανδρος ἀπ' ἐξοδίας λέγεται ἀπιὼν ἐστεφανωμένος κιττῷ εἶναι καὶ αὐτὸς καὶ ἡ στρατία.... καίτοι γε διεφιλοτιμήθη Ἅρπαλος ἐν τοῖς παραδείσοις τοῖς περὶ Βαβυλῶνα φυτεύων πολλάκις καὶ πραγματεύομενος, ἀλλ' οὐδὲν ἐποίει πλέον· οὐ γὰρ ἐδύνατο ζῆν ὥσπερ τἆλλα τὰ ἐκ τῆς Ἑλλάδος. (*HP* 4.4.1)
>
> But [they say] that in India ivy appears on the mountain called Meros; they tell the story that Dionysus is from there. For this reason, even Alexander, when he was coming back from an expedition, is said to have been crowned with ivy, himself and his army.... However, Harpalus often made a great effort planting it in the gardens around Babylon and taking pains, but he made no more progress. For it was not able to live, unlike the other plants from Greece.

Theophrastus is certainly not aiming to present character sketches of Alexander and Harpalus in a work on plants. Yet the divergent destinies of the two are implied and foreshadowed by their interactions with the "Greek" plant, ivy. Alexander receives as a crown of victory ivy grown naturally in India,[68] while at the same time Harpalus fails in his attempt to introduce foreign ivy into Babylon. Thus ivy can be seen as a stand-in for Greekness and, as a consequence, Greco-Macedonian hegemony. India, the farthest edge of the empire, crowns Alexander in the same way Greece would have crowned him: with a naturally occurring ivy plant. The two poles of the empire are brought together through the use of this crown. In contrast to Alexander's success, Harpalus' failure to implant this aspect of Greekness in Babylon is followed by his flight to Athens and his demise. Their experiences with ivy

[68] Whether Alexander actually found ivy cannot be known. Pearson 1960 215n15 notes that Arrian reports the same story as Theophrastus regarding real ivy (κισσός) on Mt. Meros (5.2.5-7), whereas Cleitarchus has *skindapsos* instead, which is merely κισσῷ προσόμοιον (*FGrH* 137 F 17 = Schol. Apoll. Rhod. 2.904).

demonstrate the respective successes and failures of Alexander and Harpalus in establishing their personal hegemony and, more broadly, Greco-Macedonian control in the east.

A first important feature from Theophrastus' story is the juxtaposition of Alexander and his ivy crown with Harpalus. A second is the lack of an explicit reason for Harpalus to be importing Greek plants to Babylon: the reader is left to assume the importation was done on Harpalus' initiative. But when Pliny discusses ivy (citing Theophrastus) he gives some different twists to the story:

> hedera iam dicitur in Asia nasci. circiter urbis Romae annum CCCCXXXX negaverat Theophrastus, nec in India nisi in monte Mero, quin et Harpalum omni modo laborasse, ut sereret eam in Medis frustra, Alexandrum vero ob raritatem ita coronato exercitu victorem ex India redisse exemplo Liberi patris. (*NH* 16.144)
>
> I have already said that ivy grows in Asia. Theophrastus, in about the 440th year since Rome's founding, denied this, saying that it does not grow in India except on Mt. Meros. He says additionally that Harpalus made every effort to sow it in Media, but in vain. But he says that due to its scarcity Alexander returned from India having crowned his army with ivy, following the example of Bacchus.

The building blocks here are the same as in Theophrastus' version: Harpalus and Alexander are presented together, and they have different interactions with ivy. But Pliny adds the note that Alexander chose a crown of ivy *ob raritatem*, an addition that further emphasizes the importance of this event. Additionally, Pliny makes more explicit the comparison of Alexander with the "Dionysus of the west" of the Indians, who receives his ivy wreath on Mt. Meros,[69] whereas Theophrastus merely says that Alexander was crowned because Dionysus was from the mountain, not in order to follow the god's example. The additional development of the legend of Alexander is responsible for these new features in the story.

[69] For the Indian stories about Dionysus, cf. Arrian, *Anabasis* 5.2-3, Curtius 8.10, and Megasthenes *BNJ* 715 F 4. Bretzl 1903 243 attributes the statement in Arrian to Aristobulus, though he is not followed by *FGrH* or by *BNJ*. Bosworth 1980- *ad loc.* comments on the development of the story of the vegetation of Mt. Meros: from ivy and bay in Arrian to the vine and olive as well in Curtius.

When Plutarch tells this story, he cites Theophrastus,[70] but makes some significant changes. First, consider his version in the *Table-Talk*:

> ὃ δὲ μέγιστόν ἐστιν ὑπὸ Θεοφράστου δ' ἱστόρηται, Ἀλεξάνδρου κελεύσαντος Ἑλληνικὰ δένδρα τοῖς ἐν Βαβυλῶνι παραδείσοις ἐμβαλεῖν Ἅρπαλον, μάλιστα δέ, τῶν τόπων ἐμπύρων ὄντων καὶ περιφλεγόντων, τὰ ἀλσώδη καὶ εὐπέταλα καὶ σκιερὰ δ' καταμῖξαι τοῖς φυτοῖς, μόνον οὐκ ἐδέξατο τὸν κιττὸν ἡ χώρα, καίτοι πολλὰ τοῦ Ἁρπάλου πραγματευομένου καὶ προσφιλονεικοῦντος· ἀλλ' ἀπώλλυτο καὶ κατεξηραίνετο τῷ πυρώδης μὲν αὐτὸς εἶναι, πρὸς πυρώδη δὲ μίγνυσθαι γῆν οὐ λαμβάνων κρᾶσιν ἀλλ' ἐξιστάμενος. (*Table-Talk* 3.2.1)
>
> The greatest proof [*sc.* of ivy's being a hot plant] has been given by Theophrastus: Alexander ordered Harpalus to bring in Greek trees to the *paradeisoi* in Babylon, and, because the region was fiery and withering, to combine with the plants especially those trees that were from the forest and leafy and shady. The land rejected ivy alone, though Harpalus persisted vehemently and made great efforts. It dried up and died because the plant itself was fiery and would not enter into combination with a fiery land, but shrank from it.

The major alteration here is that now it is on *Alexander's* initiative that Harpalus imports Greek plants to Babylon. This removes any implication that Harpalus' motives were wrong, or that his failure to succeed in gardening had any significance (metaphorical or otherwise) for his failed political career. Additionally, Plutarch has added "scientific" reasoning to Theophrastus' account: ivy is a hot plant and so it cannot thrive in a hot environment. Unfortunately, Theophrastus does not give this reason, and Plutarch has gotten Theophrastus' botany backwards. Theophrastus' theories about plant-climate suitability would dictate that a hot plant prefers a hot environment.[71]

In Plutarch's other version of the story, Harpalus is again a guerilla gardener, but the scientific error remains:

> Ἅρπαλος δὲ τῆς χώρας ἀπολειφθεὶς ἐπιμελητὴς καὶ φιλοκαλῶν Ἑλληνικαῖς φυτείαις διακοσμῆσαι τὰ βασίλεια καὶ τοὺς περιπάτους, τῶν μὲν ἄλλων ἐκράτησε, τὸν δὲ κιττὸν

[70] See Sharples 1995 168-169 for a survey of Plutarch's other citations of Theophrastus' botanical works.

[71] Hughes 1988 68-9.

> οὐκ ἔστεξεν ἡ γῆ μόνον, ἀλλ᾽ ἀεὶ διέφθειρεν οὐ φέροντα τὴν κρᾶσιν· ἡ μὲν γὰρ πυρώδης, ὁ δὲ φιλόψυχρος. (*Alexander* 35.15)
>
> Harpalus, being left as caretaker of the country and being eager to adorn the royal gardens and pathways with Greek plants, succeeded with the others, although the soil did not support ivy, but always killed it, since it could not endure its temperament. For the soil was fiery, but the plant was fond of coolness.

In this passage, Plutarch makes explicit that the impulse to import plants to Babylon came from Harpalus alone, a conjecture that was merely implicit in Theophrastus and Pliny. Harpalus' desire to beautify the gardens is presented as an idea that came to him when he was left alone and unsupervised. This jibes well with the portrayal of Harpalus as a rogue and then a failure, though the differing motivations for the importation of Greek plants are hard to explain. Based on the arguments I give below, I think that Harpalus' gardening program was undertaken on his own initiative, as the *Life of Alexander* passage states.

As has been shown, the establishment and adornment of παράδεισοι was rightly the prerogative of the monarch, or, at least, it ought to have been under his purview (as in the letter to Gadates quoted above). But Alexander had been gone for a long time and his "long absence in India aroused in many the expectation that he would not return."[72] Indeed, Harpalus' gardening activities should be seen in the broader context of power-grabs by provincial officials during Alexander's absence, and Harpalus' subsequent flight would then be seen as a reaction to Alexander's reassertion of his authority.[73] Thus, Harpalus' garden should be seen as a statement of his personal authority, as well as of his Greek identity.[74]

---

[72] Badian 1961 19.

[73] Per Badian 1961's interpretation of the Alexander's actions as a "reign of terror" upon his return from India in 324 BCE.

[74] Fauth 1977 14-15 emphasizes the Dionysiac aspect of the ivy, and believes that Harpalus was attempting to merge Dionysus with the indigenous traditions of kingly gardening.

There exist parallels in Plutarch for this kind of symbolic assertion of power by a subordinate through the means of gardening. For instance, a partial parallel to the tale of Harpalus' garden is found in his *Alcibiades*. After describing the satrap Tissaphernes as κακοήθης καὶ φιλοπόνηρος, just like Alcibiades himself, Plutarch goes on to describe his pleasure gardens:

> ὧν γὰρ ἐκέκτητο παραδείσων τὸν κάλλιστον καὶ ὑδάτων καὶ λειμώνων ὑγιεινῶν ἕνεκεν, διατριβὰς ἔχοντα καὶ καταφυγὰς ἠσκημένας βασιλικῶς καὶ περιττῶς, Ἀλκιβιάδην καλεῖν ἔθετο· καὶ πάντες οὕτω καλοῦντες καὶ προσαγορεύοντες διετέλουν. (*Alcibiades* 24.5)
>
> He [*sc.* Tissaphernes] gave the name "Alcibiades" to the most beautiful (because of its health-giving waters and lawns) of the parks [παράδεισοι] he had, a park which had resorts and retreats that were royally and extravagantly cultivated; everyone was always calling it and referring to it by that name.

The contents of Tissaphernes' "Alcibiades" garden are not described, but its royal nature is clear. The adverb βασιλικῶς is a signal that Tissaphernes has overstepped his proper position as a satrap, and is assuming royal trappings.[75] This foreshadows his involvement in the dispute between Artaxerxes II and Cyrus that is recounted in Xenophon's *Anabasis*. Tissaphernes thus has gone beyond the proper behavior of a subordinate and his presumption in establishing royal gardens prefigures his forays into the royal politics of the empire.

In addition to displaying his boundary-crossing and assertion of personal power, Harpalus' garden displays his Greek identity. The beautification program consists of using Greek plants in particular, and at the time he was doing this, Alexander was in the east, and was presenting himself as a successor to the Achaemenids rather than as a mere Greek king. Thus it is a significant fact that Harpalus was bedecking the gardens of Babylon with Greek

[75] Briant 2002 201-2 discusses other instances of satraps instituting παράδεισοι, though he attributes the urge to do so to their "eager[ness] to identify with the Great King." I suggest that in addition an element of rivalry would always be present. Centralized control of resources would demand that an expenditure on this scale and of this type would be a significant statement by the subordinate official.

plants at the same time Alexander was shedding aspects of his Greekness. In this way, Harpalus was going beyond Alexander in his philhellenism, a tendency which came to fruition in his flight to Athens in 324 BCE.[76]

From this analysis we should return to Theophrastus, whose telling of this anecdote is the source of the later passages. First, several things that are implicit in the version in the *HP* are made explicit by later authors: Pliny firms up the comparison between Alexander and Dionysus, and Plutarch in his *Life of Alexander* describes Harpalus' motivation for importing Greek plants to Babylon as a royal gesture. The seeds of these elaborations are certainly present in Theophrastus, but the later authors draw out the symbolic potential of ivy to a greater extent: it represents Dionysus, Greekness, power; it represents the downfall of Harpalus and the triumph of Alexander.

This symbolic nature of ivy can be seen elsewhere in the Greek east. In II Maccabees it is reported that, among the other atrocities Antiochus IV perpetrated upon the Jews, he forced them to wear ivy for the festival of Dionysus:

> γενομένης δὲ Διονυσίων ἑορτῆς ἠγαγκάζοντο κισσοὺς ἔχοντες πομπεύειν τῷ Διονύσῳ. (II Maccabees 6:7)
>
> When the feast of Dionysus came, they were compelled to walk in the procession in honor of Dionysus, wearing wreaths of ivy.

Here the ivy wreaths themselves have essentially the same implication as in the Harpalus/Alexander story: Greek hegemony, here again via ivy's connection with the cult of Dionysus. But in II Maccabees the circumstances are necessarily different, due to the fact that these wreaths are not worn willingly, and they are worn not by victorious Greeks but by

[76] Blackwell 1999 12-13 discusses the friendly relations Harpalus enjoyed while in Athens, and considers him an adopted Athenian citizen who then had to deal with embassies from Alexander, the eastern monarch.

downtrodden Jews. Ivy here is a tool of oppression. It is a foreign plant that is part of a foreign ritual for a foreign god, and it has been imposed cruelly upon a subject people.[77]

This account and the narrative of Harpalus and the ivy both demonstrate the symbolic power of a particular plant in the context of Greco-Macedonian imperialism. Importing and growing ivy on the one hand and being crowned with it on the other each signify separate aspects of this imperialism: the former, its forced imposition on an unwilling land, and the latter, the land's willing acceptance of a foreign ruler as if he were a native.

3.4.2 *Laudes Italiae* in Virgil and others

The Roman Empire, though it did not extend as far east as the Seleucid, did come into contact with eastern notions of the connection between gardening and kingship, as well as with the idea of a royal garden as being a showpiece for the breadth and power of an empire. Additionally, as Edwards has shown, late Republican and early Imperial Rome was interacting in polyvalent ways with the spoils of eastern victories.[78] Eastern gardens can be viewed in this context as yet another kind of conquered artifact, but one that requires more upkeep and knowledge to manage its success in Rome. Rome's acquaintance with eastern-style paradeisoi goes back at least to Lucullus, Pompey's predecessor in the wars against Mithradates and Tigranes. Plutarch tells of the reaction to his gardens in Rome and his landscaping elsewhere:

> καὶ νῦν, ἐπίδοσιν τοιαύτην τῆς τρυφῆς ἐχούσης, οἱ Λουκουλλιανοὶ κῆποι τῶν βασιλικῶν ἐν τοῖς πολυτελεστάτοις ἀριθμοῦνται, τὰ δ' ἐν τοῖς παραλίοις καὶ περὶ Νέαν πόλιν ἔργα, λόφους ἀνακρεμαννύντος αὐτὸν μεγάλοις ὀρύγμασι καὶ τροχοὺς θαλάσσης

[77] Interestingly, when the Maccabees recapture and rededicate the temple, they seemingly use Dionysian regalia in their victory celebration: διὸ θύρσους καὶ κλάδους ὡραίους, ἔτι δὲ φοίνικας ἔχοντες ὕμνους ἀνέφερον τῷ εὐοδώσαντι καθαρισθῆναι τὸν ἑαυτοῦ τόπον: "Therefore, holding stalks and fresh branches and even palms, they sang hymns to him who had assisted them in purifying his place" (II Maccabees 10:7).

[78] Edwards 2003, on the presence of foreign sculpture and sculptural representations of foreigners in the world city of Rome.

καὶ διαδρομὰς ἰχθυοτρόφους τοῖς οἰκητηρίοις περιελίσσοντος καὶ διαίτας ἐναλίους κτίζοντος, ὁ Στωικὸς Τουβέρων θεασάμενος Ξέρξην αὐτὸν ἐκ τηβέννου προσηγόρευσεν. (*Lucullus* 39.2-3)

Even now, when luxury has developed to such an extent, the gardens of Lucullus are counted among the most costly of the imperial gardens, and when the Stoic Tubero saw his works on the shore and near Naples, where he suspended hills atop large tunnels, wound circuits of sea and runs for fish-breeding around his houses, and built dwellings in the sea, he proclaimed that Lucullus was Xerxes in a toga.

In addition to this negative anecdote about Lucullus, we can see more positive receptions to eastern concepts of king and garden. Cicero repeats Xenophon's praise for royal gardening in *De senectute* 59.[79] It is clear that by the late Republic, the idea of the garden's connection to power was current in Rome.

It is in this environment, then, that Virgil composed his famous *laudes Italiae* in book 2 of the *Georgics*. My aim here is not to analyze thoroughly the whole section, but rather to bring out a few key features that are relevant for later developments after Rome's transition from republic to principate. It does not matter to me whether the *laudes* are to be interpreted in an unabashedly positive light,[80] or as a more negatively-tinged modification of ethnographic praises.[81] Virgil wrote them using the cultural resources and imagery he had to hand, and thus they reflect directly the current ideas concerning the imperial value of plants.

The section immediately preceding the *laudes* begins "not every land is able to bear everything" (*nec vero terrae ferre omnes omnia possunt*; 2.109).[82] Here Virgil recounts the

[79] Cicero also translated the *Oeconomicus* into Latin, portions of which are quoted in books 11 and 12 of Columella's *Res rustica*. This shows the evident popularity of Xenophon's work in late Republican and early Imperial Rome.

[80] As, most extremely, Canter 1938 457-458, undoubtedly tinged by the author's own idyllic view of Italy.

[81] As Thomas 1982 38-50, with persuasive analysis, based on Virgil's imposition of man-made features and war onto the standard "golden age" imagery.

[82] As I have discussed in the previous chapter, it was well established in Virgil's time that not all plants could grow in all environments. Similarly to Virgil, Vitruvius notes that the kinds of water contained in the soil determine which plants can grow in a place:

marvelous things that grow in foreign parts: only India grows ebony, and only Arabia frankincense (*sola India nigrum fert ebenum, solis est turea virga Sabaeis*; 2.116-7). Virgil lists cotton (*nemora Aethiopum molli canentia lana*; 2.120), silk (*velleraque ut foliis depectant tenuia Seres*; 2.121), the banyan (*quos Oceano propior gerit India lucos*; 2.122), and citrons (*Media fert tristis sucos tardumque saporem felicis mali*; 2.126-7) as examples of marvels that grow only outside of Italy. His transition into the *laus* proper begins, appropriately enough, with a device somewhere between a priamel and a *praeteritio*:[83]

> sed neque Medorum, silvae ditissima, terra,
> nec pulcher Ganges atque auro turbidus Hermus
> laudibus Italiae certent, non Bactra neque Indi
> totaque turiferis Panchaia pinguis harenis.
> haec loca non tauri spirantes naribus ignem
> invertere satis inmanis dentibus hydri
> nec galeis densisque virum seges horruit hastis;
> sed gravidae fruges et Bacchi Massicus humor
> inplevere; tenent oleae armentaque laeta. (2.136-44)
>
> But neither the land of the Medes, though richest in forests, nor the lovely Ganges, nor the Hermus, thick with gold, can vie with Italy in merits, nor can Bactria nor the Indians, nor all of Panchaia, rich with incensed sands. Here bulls breathing fire through their nostrils did not turn the soil for sowing with the teeth of a monstrous dragon, nor did the crops bristle thickly with the helmets and lances of warriors. These regions have been filled with heavy harvests and the Massic juice of Bacchus. They are possessed by olives and fertile flocks.

Virgil then goes on to recount various praiseworthy features of Italy. First, we should note that Virgil's praise is not economic, but aesthetic. In contrast to the praises given by Varro in

---

> quodsi terra generibus umorum non esset dissimilis et disparata, non tantum in Syria et Arabia in harundinibus et iuncis herbisque omnibus essent odores neque arbores turiferae, neque piperis darent bacas nec murrae glaebulas, nec Cyrenis in ferulis laser nasceretur, sed in omni terra regionibus eodem genere omnia procrearentur. (*De architectura* 8.3.13)
>
> If nations did not have soils that are different and distinct in their moisture, it would not be only in Syria and Arabia that there are scents in the reeds and rushes and all grasses, or that there are frankincense-bearing trees, or ones that yield pepper berries or lumps of myrrh, and it would not be only in the stalks of Cyrene that *laser* is produced, but rather all things would be generated to be of the same type in every soil everywhere.

[83] See Thomas 1988 *ad loc.* for a discussion of this particular technique's debt to the ethnographical tradition.

his *Res rusticae* (1.2.6-10), Virgil does not confine himself to the mere monetary potential of Italian fields.[84] Second, we should take these *laudes* in the context of what precedes them. Virgil's Italy is praiseworthy not for its ability to grow exotic plants, but in spite of this. It is best at producing the flora that Romans were familiar with, and this is reckoned more important than the ability to grow any and all exotic plants.

This somewhat ambivalent attitude about Italy's fertility changed after the establishment of the principate. When Columella, writing around 70 CE, composed a "praises of Italy" in book 3 of his *Res rustica*, in some respects he followed the example of Virgil. But he writes that some of the same plants that Virgil reported grew only elsewhere were in fact quite happy to grow in the fertile soil of Italy:

> Mysiam Libyamque largis aiunt abundare frumentis; nec tamen Apulos Campanosque agros opimis defici segetibus. Tmolon et Corycon florere croco; Iudaeam et Arabiam pretiosis odoribus illustrem haberi: sed nec nostram civitatem praedictis egere stirpibus, quippe compluribus locis urbis iam casiam frondentem conspicimus, iam turream plantam, florentesque hortos myrrha et croco. his tamen exemplis nimirum admonemur, curae mortalium obsequentissimam esse Italiam, quae paene totius orbis fruges adhibito studio colonorum ferre didicerit. (*RR* 3.8.4-5)
>
> They say that Mysia and Libya abound in much grain; still the Apulian and Campanian fields do not lack rich produce. They say that Tmolus and Corycus bloom with saffron, and that Judaea and Arabia are considered famous for their precious scents. But they say that our country does not lack the previously mentioned plants: in many areas of the city we at one time see cassia in leaf, and then frankincense, and we see gardens blooming with myrrh and saffron. By these examples we are surely reminded that the land most responsive to human tending is Italy, which has learned to bear the fruits of almost the whole world when effort has been applied.

What has changed between these two accounts? These different "gardens" mirror the new, outward gaze of the Roman Empire. From Columella's passage we can see the imperial

[84] As Fundanius rhetorically asks in Varro's dialogue: *quid in Italia utensile non modo non nascitur, sed etiam non egregium fit?* (What useful item is not only not grown in Italy, but also is not made excellent?) Varro's praises concentrate on wine, oil, grain, and the monetary return one can expect from farming Italian land.

significance of local cultivation of exotic foreign plants, specifically those that yield luxury goods such as perfumes and spices.

In Pliny's *Natural History* too we can see the influence of empire on how plant cultivation was viewed. His special interest in botany is evident from the number of books he devotes to plants (16 out of 37) as well as from his emphasis on practical learning for Romans.[85] He explicitly connects the movement of plants to the *pax Romana* in an exclamation near the beginning of book 27:

> Scythiam herbam a Maeotis paludibus et Euphorbeam e monte Atlante ultraque Herculis columnas ex ipso rerum naturae defectu, parte alia Britannicam ex oceani insulis extra terras positis, itemque Aethiopidem ab exusto sideribus axe, alias praeterea aliunde ultra citroque humanae salutati in toto orbe portari, inmensa Romanae pacis maiestate non homines modo diversis inter se terris gentibusque, verum etiam montes et excedentia in nubes iuga partusque eorum et herbas quoque invicem ostentante! (*NH* 27.2-3)
>
> That the plant from Scythia is brought from the swamps of Lake Maeotis and the euphorbia from Mt. Atlas and beyond the Pillars of Hercules, from the spot where Nature fades away, and that from another place the Brittanica is brought from the islands in Ocean, located beyond the earth, and that indeed the plant Aethiopis is brought from a region burnt by the fire of heaven, and moreover others from other places, here and there over the entire world, for the benefit of human health! This is due to the great authority of the *pax Romana*, which displays to each other not only people from differing lands and nations, but even mountains and ranges that reach above the clouds, their produce and even plants.

Though the east is not mentioned here, Pliny's enthusiasm for the international trade in plants is clearly based on an imperial foundation.[86] Though the *NH* as a whole does not reflect Roman imperial ideology, either in terms of its structure or of the data included in it,[87] in instances such as this Pliny is showing how steeped he is in the culture of his time. He has connected the influx of plants to study with the growth and maintenance of Roman authority in the

[85] Beagon 1992 223-237.

[86] Fear 2011 25 states that for Pliny "talk of plants is talk of empire." See also Beagon 1992 193.

[87] Woolf 2011 81-85.

Mediterranean. These plants, when they arrived in Rome, could be looked after and examined in gardens full of exotic plants. He discusses that he has learned much from the "botanical garden" of Antonius Castor, in which numerous plants from all over the world are grown:

> nobis certe, exceptis admodum paucis, contigit reliquas contemplari scientia Antoni Castoris, cui summa auctoritas erat in ea arte nostro aevo, visendo hortulo eius, in quo plurimas alebat centesimum annum aetatis excedens, nullum corporis malum expertus ac ne aetate quidem memoria aut vigore concussis. (*NH* 25.9)
>
> Indeed, it has been my privilege to study all [plants] except just a few, benefiting from the expertise of Antonius Castor, who was the greatest authority in this art in our time. I toured his little garden, in which, though he was over the age of 100, he grew large numbers of plants. He had no bodily ailment and did not even suffer from loss of memory or energy due to his age.

Pliny does not specify the location of this garden, or its precise contents, but it is clearly the institution of a Roman who was familiar with plants from around the world.[88] Castor is cited elsewhere in the *NH*, usually as an authority on the medicinal uses of plants.[89] Some evidence for the scope of his gardening may come from Pliny's chapter on *piperitis* (also known as *siliquastrum*), which is traditionally identified as pepperwort (*Lepidium campestre*) but is more similar in description to true cardamom (*Elettaria cardamomum*).[90] If Pliny knew this plant from Castor's garden or from Castor's written description of it from his garden, native-grown cardamom would be as significant for Roman imperial thought as nativized pepper (see below). Castor's garden, then, would provide physical evidence of Pliny's imperialist plant rhetoric.

Elsewhere in the *NH*, as shown by Naas, Pliny's Rome-centric view of the world leads him to discuss exotic plants and animals in terms of their first appearance in the city, and to

[88] On Pliny's use of botanicalsources later than Theophrastus (all lost to us now, unfortunately), see Lloyd 1983 139-140.

[89] At *NH* 20.174 on *piperitis/siliquastrum*, at 20.244 on *marrubium* (horehound), at 20.261 on *ferula* (fennel), at 23.166 on a kind of wild myrtle, and at 26.51 on *potamogiton*, which seems from the description to be a species of *Equisetum* (horsetail).

[90] Prance and Nesbitt 2005 158.

subsume the *mirabilia* of the world to those of Rome, making Rome a wondrous world of itself.[91] This is often accomplished by comparing Rome and India—as I have also tried to do at points in this chapter! For instance, when Pliny extols the fertility of Italy in book 37, he puts India in an implicit second place, thereby emphasizing the fertility of the center of the Roman Empire by raising it above the level of lands beyond its borders.[92] He also twice mentions a native Italian pepper that should be preferred to costly imported pepper.[93] Pliny's tone in these passages is more moralizing than Columella's: if pepper can be found in Italy, why do profligate people purchase it from India? I will further discuss pepper's status as a marker of (foreign) luxury in chapter 5, but for now it is enough to note that Pliny nativized pepper, at least in writing, creating a Rome that was sufficiently fertile to grow everything required by its populace.

The development of these *laudes Italiae* in various Roman authors shows the impact of actual empire on the imagined fertility requirements for an imperial center. Virgil's Italy is the best, but on its own terms. It is the best at its own game, growing traditional crops better than anywhere else. In later authors, Italy must compete on a larger stage, and it does successfully. Columella and Pliny relate (or create) an Italy that is the wonder of the wide world, that shines above its neighbors and can grow anything they can. Rome has conquered the world on any terms, including those of growing frankincense, cardamom, and pepper.

[91] Naas 2011.

[92] *NH* 37.201-203. I say "implicit" because Pliny removes the *fabulosa* of India from consideration when deciding that Spain belongs in second place. See Canter 1938 460.

[93] *NH* 12.26-27 and 16.136. It is unclear what plant (if any) he is referring to.

3.4.3 Other imperial gardens

One could list many historical and modern phenomena that are similar to the royal gardens and *paradeisoi* of the Greeks and Romans. Here I choose two to compare: the somewhat parallel and independent case of developments in kingship in India and the case of European (primarily British) colonial empires in the seventeenth through twentieth centuries. What can we learn by juxtaposing these cases with Greek and Roman gardens? First, we can see that the use of plants to express power is a common feature of various systems of hegemony, though the specific development of the royal garden is not always present. Second, we can see the higher importance of other concerns (primarily economic) in other cases of plant transportation. These concerns, if not totally absent, were at least subordinate in the Mediterranean world.

3.4.3.1 Indian kingship and Aśoka

It is recognized in Indian texts on kingship that the king is responsible for the maintenance of the natural world. In the *Arthaśāstra*, a Sanskrit text on governance that is traditionally attributed to Kauṭilya, a minister to Chandragupta, the king is instructed to protect trees and other plants as a "source of wealth and enjoyment for humankind."[94] In the ninth book of the *Manusmṛti*, a text from the *dharmaśāstra* tradition of Sanskrit legal works, there is a list of places the king must protect from thieves:

> sabhāprapāpūpaśālāveśamadyānnavikrayāḥ |
> catuṣpathāś caityavṛkṣāḥ samājāḥ prekṣaṇāni ca || 264 ||
> jīrṇodyānāny araṇyāni kārukāveśanāni ca |
> śūnyāni cāpy agārāṇi vanāny upavanāni ca || 265 ||
> evaṃvidhān nṛpo deśān gulmaiḥ sthāvarajaṅgamaiḥ |
> taskarapratiṣedhārthaṃ cāraiś cāpy anucārayet || 266 ||

[94] Narayanan 1997 300-301; Findly 2008 346.

> Meeting halls, wells, bakeries, brothels, alcohol and food shops, crossroads, sacred trees, meeting places, places for public shows, old gardens, forests, the workshops of artisans, empty rooms, woods, and groves: the king should cause such places to be patrolled by moving or stationary troops and even spies in order to block thieves.

Plants and gardens play a large part in this list: *caityavṛkṣāḥ* (sacred trees), *jīrṇodyānāni* (old gardens), *araṇyāni* (forests), *vanāni* (woods), and *upavanāni* (groves) are all included as places that are worth protecting. This responsibility of the king can be traced to the idea, common in *dharmaśāstra*, that right conduct (*dharma*) protects as it is protected (*dharmo rakṣati rakṣitaḥ*; *Manusmṛti* 8.15) The king's responsibility to the natural world is part of his responsibility to preserve *dharma* for his people.[95]

These theoretical and normative texts can be supplemented by historical evidence about one particular Indian monarch: Aśoka (304-232 BCE), the grandson of Chandragupta, who is perhaps most famous for his conversion to an early form of Buddhism. He promoted his new faith in a series of monumental stone inscriptions that have been found all over his empire and as far west as Kandahar in modern-day Pakistan.[96] In two of these inscriptions, Aśoka mentions his transplantation of plants.[97] In his Rock Edict 2, he details how he has made provision for medical treatment in his domain and in the domains of his neighbors, including the Seleucid Antiochus (probably II), who is called the king of the *Yavanas* (*Aṃtiyaka Yona-rāja*):

> osudhāni ca yāni manusopagāni ca pasopagāni ca yata yata nāsti, sarvatrā hārāpitāni ca ropāpitāni ca. mūlāni ca phalāni yata yatra nāsti, sarvata hārāpitāni ca ropāpitāni ca.
>
> [W]herever there were no medicinal herbs beneficial to men and beneficial to animals, they have been caused to be imported and planted. Wherever there were no roots and fruits, they have been caused to be imported and planted. (trans. Sircar)

[95] Findly 2008 344-345.

[96] See Sen 1956 1-10 and Sircar 1967 29-36 for overviews of the find-places and the languages used in the inscriptions.

[97] See Findly 2008 26 and 351-352.

Aśoka makes a similar claim in his Pillar Edict 7, noting that he had banyans and mango groves planted along the roads to provide shade for people and animals (*chāyopagāni hosaṃti pasumunisānaṃ*).[98] Additionally, there is a story told in the *Mahāvaṃśa* (a romanticized history of Sri Lanka written in Pali) that Aśoka sent a branch of the sacred bodhi tree to the island. Upon doing so, he spoke a *satyakriyā*, a speech act that is both a declaration and a wish:[99]

> "So truly as the great Bodhi-tree shall go hence to the isle of Laṅkā, and so truly as I shall stand unalterably firm in the doctrine of the Buddha, shall this fair south branch of the great Bodhi-tree, severed of itself, take its place here in this golden vase." (18.40-41; trans. Geiger)

The historical veracity of this story is not high, yet it shows the symbolic importance of a specific plant, and of its transportation. The bodhi tree was a symbol of Buddhism, and its presence on the island of Sri Lanka emphasizes the king's support for the island's conversion.

What we do not see, however, from these examples from Indian history and theory are actual gardens. As mentioned above, there is no direct evidence for Persian-influenced monumental gardens in India before the Mughal Period. Before I turn to a different case study, where gardens are much in evidence, it is useful to summarize what value plants did have in relation to Indian notions of kingship. First, they served as representations of the king's responsibility for his land's fertility through his obligation to protect and nurture the natural world. Second, exotic plants in particular were important as symbols of religion or of a king's beneficence (by providing medicine where no suitable local plants existed). But these interactions with plants are much clearer in the case of European colonial empires and their botanical gardens.

[98] Sircar 1967 25-26 collects and analyzes the beneficent acts recorded in the inscriptions.

[99] Geiger 1950 125n3; Findly 2008 322.

3.4.3.2 European botanical gardens

Numerous modern studies have attempted to determine the economic and symbolic importance of botanical gardens for European colonial empires.[100] In particular, the British Empire has been well-studied, and it is here that we will turn for a case study to set alongside the gardens of Greece and Rome. By the Victorian period, the British operated botanical gardens at various colonial sites in conjunction with the main center at Kew.[101] These gardens, by their very presence, would express the extent and the authority of the British Empire.[102] Brockway's 1979 monograph on the role of the British gardens, though mostly a scientific and economic study, begins with an imagined tour of Kew. Here, at the center of the British Empire, the plants from all its territories are on display:

> Inside the Palm House we are dwarfed by the soaring trunks of the palms and fascinated by the luxurious growth of the many other tropical species—balsa, breadfruit, bananas, and bamboos. One Malaysian species of bamboo grows to the roof in a single season. In this building we feel the extent of the British maritime and colonial penetration of the entire world. (p. 3)

Other gardens, too, were open to the public for picnicking and recreation, and thereby displayed the extent and majesty of the empire to each visitor. However, the locations of these gardens were often at a distance from dense settlement, and thus their place in the day-to-day life of the average person would have been minimal.[103] The impact of the monumentality displayed in these gardens would have been small, and would have been directed at an elite audience. Yet the imperialist message coded within the gardens remains, even if it is not

[100] For instance, Brockway 1979 and 1983, McCracken 1997, and Schiebinger 2004.

[101] McCracken 1997 19 lists 115 gardens in the British Empire between 1837 and 1901. These included stations in India (primarily at Calcutta), Sri Lanka, Malaysia, Hong Kong, Australia, New Zealand, South Africa, Mauritius, St. Helena, and at various spots in the British Caribbean.

[102] Schiebinger 2004 11-12 characterizes botanists and botanical gardens during this period as "agents of empire."

[103] McCracken 1997 167 estimates an average distance of about two miles.

widely divulged. British botanical institutions did display the power and hegemony of the British state, though it is more of an incidental result than an aimed-at purpose.

These institutions, and other colonial gardens, were established primarily to serve economic purposes.[104] Even the most "scientifically-minded" botanists had economic motives for their studies in transportation and in plant classification and nomenclature. Linnaeus himself had the goal of importing exotic species to Sweden to help his country avoid famine.[105] The gardens established under this system functioned as collection points and way stations for the transport of plants from one edge of the empire to another, often from areas of rich natural resources (such as South America and the Caribbean) to areas of abundant labor.[106] This transplantation resulted in lucrative trade monopolies and increased revenue for the colonial power. Even today, Kew Gardens displays economically valuable plants and plant products from around the world in its Plants + People Exhibition near the Palm House.[107]

In some ways, this situation is similar to that found in the Greek east, yet on the whole it is based on a different economic and cultural footing. The royal gardens we find in Greece and Rome (and their predecessors in Persia and Mesopotamia) were not established primarily to create monopolies on various items of trade, but rather as vehicles to express power. Yet the economic aspects of British and other European botanical gardens have a definite place in

[104] Brockway 1979 is primarily a study of the role the British botanical gardens played in the propagation of three major cash crops: rubber, cinchona, and sisal. She gives a survey of the plantation economy produced by these plants, along with sugar, spices, cotton, tea, etc. at pages 46ff. McCracken 1997 74-110 also details the various economic experiments the system undertook, and at 132-135 he discusses how the gardens did not always serve the economic purpose for which they were intended.

[105] Schiebinger 2004 6-7.

[106] Brockway 1979 14, 18-20 discusses the transfer first of silver and gold, then of plants from the New World to colonial possessions in the Old World.

[107] This exhibition emphasizes the valuable contributions Kew scientists and researchers were able to make, and makes no reference to the imperial motives behind them.

expressing hegemony over a subject people. Thus these gardens, though they do represent power as an incidental result of their economic function, are not a perfect parallel for *paradeisoi*.

3.5 Conclusion

From excurses to India and the British Empire, we turn back to the ancient Mediterranean world. These comparisons help to bring into sharper focus some of the important aspects of the royal garden in Greek and Roman culture: its primary importance as a symbol of power, and its reliance on exotic plants to express that symbolism. Through local cultivation of these exotic species (whether real or imagined, as in Pliny's pepper), the center of the empire displays its superiority to the rest of the empire in terms of its fertility: the hegemony of the centralized power is represented in biological terms.[108] In the case of the Assyrians, Babylonians, Achaemenids, and Romans, the cultural center of their empire was also its physical center. For the Seleucids, the "homeland" of Macedonia was not part of their imperial territory. Thus Seleucus' seeming attempt to show some kind of centralization of his empire through its flora is somewhat unsuccessful in comparison to the Persians and the Romans: because of this lack of centrality, Seleucid gardens were unable to create a functional equivalent of the Achaemenid *paradeisos*.

From these instances of interactions that imperial powers had with plants, both in the east and the west, some clear conclusions arise. First, the importance of the royal gardens and *paradeisoi,* though slightly different for each culture, was a constant in the east, and one that spread westward in the Hellenistic Period, and even further when eastern culture became

[108] This is very similar to Pliny the Elder's idea of Rome's being *mundus alius in uno loco*, as discussed by Naas 2011. See also Edwards and Woolf 2003 2-6 for the merging of *urbs* and *orbis* in the city of Rome.

known at Rome. Through these gardens, the power of the king was displayed at the same time as the extent and fertility of his realm. Second, the ability to successfully cultivate plants could be seen metaphorically as indicative of the ability to control an empire. The Assyrians and Achaemenids succeeded in growing foreign plants in Persepolis, but Seleucus I failed to introduce cardamom to Babylon and Harpalus was unsuccessful in planting ivy in the same city. Thus, problems with empire mirror or are seen to mirror problems in the garden. Also, Rome's growing knowledge of itself as an imperial power led to a change in how its agricultural fertility was presented in literature: Italy went from being a highly lush place to being a garden at the center of the world, where everything could grow. Through all of these imperial interactions with plants and gardens, exotic plants had special importance in defining the power and breadth of the empire by demonstrating the fertility of its center.

4 Exotic Plants in Theophrastus' Botanical Works

Not all interactions with exotic plants went through the channels of ethnography or imperial symbolism. Sometimes a plant is just a plant, and should be thought of as a plant. In this way, plants from the east *qua* plants were the objects of pure scientific inquiry. This kind of interaction with flora is distinguished by its seeking to answer particular kinds of questions: What are these plants really like? How do they live and function? How do they interact with the human body as food or medicine? And, perhaps most importantly: How can these plants be classified alongside the more familiar plants of the Mediterranean world? How do existing theories and systems of classification need to be altered in light of this new information?

Writers of technical treatises gave various answers to these questions as they grew to learn more about eastern flora. This process often happened quickly, especially during the first few decades after Alexander's death, when the traditional centers of learning were awash in new information from the east. To examine how this information was received, digested, and assimilated, I will focus on the botanical works of Theophrastus of Eresus, who wrote his works on botany during the heady period during and following Alexander's conquests. First I will make use of Theophrastus' *De causis plantarum* to survey the theoretical bases of his work and to demonstrate how his study of plants, particularly exotic ones, caused him to diverge from Aristotle's teleology. Second, I will focus on his treatment of plants as the objects of scientific inquiry, mostly in book 4 of his *Historia plantarum*. By comparing his discussion of plants from two exotic locations—Egypt and India—I trace elements of Theophrastus' process in receiving new information and incorporating it into his works.[1] Here my test case of forever-exotic India is set against another land that was exotic, but which also came under the

[1] Theophrastus is not the only author in whose works these processes can be seen. In the following chapter, the assimilation and classification of exotic plants will be considered as a diachronic process.

direct rule of the Ptolemies. India's value here again is in its remaining always outside the direct influence of Mediterranean powers. From these two aspects of Theophrastus' work, we can see how the expanding scope of the Greek world was reflected in the scientific endeavors of one person: how he reacted and evolved with the changing times.

4.1 The basis of botany

In chapter 2 I discussed Theophrastus as a writer of ethnography, the creator of a *Kulturgeschichte* of plants. Here I discuss him as a scientist in the Peripatetic tradition, Aristotle's pupil, colleague, and successor.[2] Neither view is mutually exclusive, of course. Theophrastus' writing about human culture is could be viewed as a simple consequence of his writing about plants—plants are used by people and thus people are mentioned—but there is a much tighter connection between these two sides of the work of Theophrastus the scholar.

As I mentioned in chapter 1, plants were studied by *physikoi* from the earliest periods of Greek science, and they were notable parts of Plato's stories about the creation and materiality of the physical world. Nevertheless, it was not until Theophrastus that botany was given an individual treatment, both as part of Aristotle's research program into the natural world and as one of the individual niches of scientific inquiry that were opened to investigation in the Peripatos. Theophrastus' importance here is not simply as the father of botany, but also as an innovative thinker, whose empirical research into plants led to theoretical revision of some of Aristotle's most deeply held ideas. It is often assumed that Theophrastus simply carries on

[2] Unfortunately, most of Theophrastus' output on topics other than botany has been lost. Project Theophrastus, started 1979 at Rutgers University by William Fortenbaugh, has attempted to put together a picture of Theophrastus as an all-around scholar. Fortenbaugh and his collaborators have published a two-volume set of Theophrastus' fragments (Brill 2003), editions of his shorter works (such as his *Metaphysics* and *On Sweat*), and numerous volumes of commentary. The series has not endeavored to produce new editions or commentaries of the *CP* or *HP*, however, judging Amigues's Budé editions to fill that gap.

Aristotle's investigations and does not develop any new theory to account for plants, but that he merely extends his master's work on animals. Based on this view, most modern scholars say that Aristotle left botany to Theophrastus.[3] This is an injustice to Theophrastus' originality as a thinker. Differences in terms of "philosophy of plants" are apparent when we look closely at how plants are theorized in the works of Theophrastus and Aristotle. These differences are due to Theophrastus' refining of Aristotle's ideas, based on his own use of empirical data, and, in particular, his exposure to vast amounts of new information from the east. The most striking and significant difference comes to light from a comparison of Theophrastus' and Aristotle's views on the final cause(s) of plants. To put it briefly, Aristotle believed in a single final cause for all living things: to fulfill their capacities. Plants occupy a low rung on the *scala naturae* that is implied in his works, because their only capacity is that of vegetative growth and reproduction. Ergo, producing seeds is the Aristotelian final cause of a plant. Theophrastus' view is more complex and takes into account interactions between humans and plants: a particular plant's final cause may be to produce a fruit that is sweet and pleasing to humans. Thus, cultivated plants can have two final causes.

To demonstrate Theophrastus' originality, I will first describe in detail Aristotle's theories about plant life and then show how Theophrastus' work diverges from his teacher. I will start with the underpinnings to Aristotle's study of nature.

[3] For this view see, e.g., Lloyd 1984 326, 351-2; Wöhrle 1985 3-21; Gotthelf 1988 113-116; Fraser 1994 172; and Wardy 2005 77.

4.1.1 Aristotle

When he began his investigations into what we now know as biology, Aristotle was creating a new field of research, one that broke sharply from the agenda of the Academy.[4] Instead of looking up to the heavenly bodies and the forms, he was looking down to the earth and the various creatures that inhabited it.[5] He felt the need to justify this novel kind of project and assert its fundamental value in a lengthy protreptic to the study of nature near the beginning of *De partibus animalium*, which I quote here in full due to its importance for the origins of the study of biology:

> τῶν οὐσιῶν ὅσαι φύσει συνεστᾶσι, τὰς μὲν <λέγομεν> ἀγενήτους καὶ ἀφθάρτους εἶναι τὸν ἅπαντα αἰῶνα, τὰς δὲ μετέχειν γένεσεως καὶ φθορᾶς. συμβέβηκε δὲ περὶ μὲν ἐκείνας τιμίας οὔσας καὶ θείας ἐλάττους ἡμῖν ὑπάρχειν θεωρίας (καὶ γὰρ ἐξ ὧν ἄν τις σκέψαιτο περὶ αὐτῶν, καὶ περὶ ὧν εἰδέναι ποθοῦμεν, παντελῶς ἐστὶν ὀλίγα τὰ φανερὰ κατὰ τὴν αἴσθησιν), περὶ δὲ τῶν φθαρτῶν φυτῶν τε καὶ ζῴων εὐποροῦμεν μᾶλλον πρὸς τὴν γνῶσιν διὰ τὸ σύντροφον· πολλὰ γὰρ περὶ ἕκαστον γένος λάβοι τις ἂν τῶν ὑπαρχόντων βουλόμενος διαπονεῖν ἱκανῶς. ἔχει δ' ἑκάτερα χάριν. τῶν μὲν γὰρ εἰ καὶ κατὰ μικρὸν ἐφαπτόμεθα, ὅμως διὰ τὴν τιμιότητα τοῦ γνωρίζειν ἥδιον ἢ τὰ παρ' ἡμῖν ἅπαντα, ὥσπερ καὶ τῶν ἐρωμένων τὸ τυχὸν καὶ μικρὸν μόριον κατιδεῖν ἥδιόν ἔστιν ἢ πολλὰ ἕτερα καὶ μεγάλα δι' ἀκριβείας ἰδεῖν· τὰ δὲ διὰ τὸ μᾶλλον καὶ πλείω γνωρίζειν αὐτῶν λαμβάνει τὴν τῆς ἐπιστήμης ὑπεροχήν, ἔτι δὲ διὰ τὸ πλησιάτερα ἡμῶν εἶναι καὶ τῆς φύσεως οἰκειότερα ἀντικαταλλάττεταί τι πρὸς τὴν περὶ τὰ θεῖα φιλοσοφίαν. (*De Partibus* 1.5 644b23-645a4)
>
> Of however many substances that exist by nature, we say that some are without coming to be and perishing for all ages, and some take part in coming to be and perishing. But it happens that we have less opportunity to observe the former, though they are valuable and divine, because altogether few aspects of them, through which someone might investigate them and about which we desire to know, are apparent to our sense faculties. We are more fortunate as regards knowledge concerning the latter, the perishing plants and animals, due to our living with them. For anyone willing to exert sufficient effort could learn many things about each kind of these existing things. Each [*sc.* non-perishing and perishing] has its interest. Even if we grasp the former only to a small degree, we do so with more pleasure than all the things around us, because of the

[4] See Lloyd 1968 68-108 for a lucid discussion of how Aristotle's independence from Plato is exemplified by his biological research. Gaiser 1985 goes so far as to argue that Theophrastus had a natural bent toward investigations of the natural world, and his association with Aristotle is what is what turned the latter to biology (53-54; 86-88).

[5] Lloyd 1983 13 discusses why the taxonomic endeavor of Aristotle's should be viewed as "scientific," though Aristotle's project was mostly descriptive and the modern term has connotations of experimentation.

> value of knowing them, just as it is more pleasurable to see a chance small portion of those we love than to observe acutely other things, great and in their entirety. But because we can know more and more fully about the latter, they have supremacy over the others in terms of our knowledge, and furthermore because of their proximity to us and their affinity in nature they balance out to some extent the philosophical inquiry about divine things.

This ambitious statement of a research program is the underpinning of Aristotle's works on animal biology.[6] Theophrastus, his pupil, friend, and successor as head of the Lycium,[7] extendes this investigation to τὰ φθαρτὰ φύτα.[8] And when Theophrastus wrote down the results of his investigations in his *Historia plantarum* and *De causis plantarum*,[9] he included no such protreptic: biology, and thus botany, had been accepted as a valuable discipline, at least among Peripatetics, and Theophrastus had no need to justify his research.[10]

This is not to imply that Aristotle *never* mentioned plants in his works. On the contrary, on numerous occasions he comments on them and their causes, often in explicit comparison to

[6] See Lloyd 1983 16 on the programmatic aspects of this book of the *De partibus*.

[7] Whether Theophrastus was also Plato's student (as reported by Diogenes Laertius 5.36) or simply met Aristotle in Assos after 347 is an unanswerable question. See Gaiser 1985 11-26 for a discussion of various opinions and the conclusion that one cannot prove the matter one way or another.

[8] The treatise *De plantis* that was transmitted with the works of Aristotle is now attributed to Nicolaus of Damascus, a Peripatetic who lived during the time of Augustus. It is possible, however, that this treatise is based to some extent on Aristotle's own work on plants, which has been lost (Drossaart Lulofs and Poortman 1989 1ff.; Amigues 1988-2006 vol. 1.vii).

[9] These are the two major preserved treatises that deal with plants. Some information about plant products is to be found in the *De odoribus*, which continues the project of the *HP* and *CP*, as alluded to by various references in *O* back to the *CP*. See Einarson and Link 1976-1990 vol. 1.viii and vol. 3.459ff. for a discussion of Theophrastus' program and an inventory of the cross-references between existing works. Theophrastus also composed other works on plant products: Diogenes Laertius (5.42-50) preserves the titles περὶ οἴνου καὶ ἐλαίου, περὶ χυλῶν α′ β′ γ′ δ′ ε′, and περὶ καρπῶν. The περὶ χυλῶν is referred to at *HP* 1.12: ἀκριβέστερον ἐν τοῖς περὶ χυλῶν ῥητέον. See also Sollenberger 1988.

[10] There is also no such introduction in Theophrastus' other surviving short works of natural science, the *De lapidipus* and *De igne*, a fact which also supposes an accepting audience: see Vallance 1988 26. It is likely that the *De igne* predates the *HP* and *CP*: it has been convincingly shown to have arisen from his time in Assos (Gaiser 1985 28-35).

animals and humans.[11] For instance, he states that plants seem to occupy an intermediate state between non-living things and animals:

> οὕτω δ' ἐκ τῶν ἀψύχων εἰς τὰ ζῷα μεταβαίνει κατὰ μικρὸν ἡ φύσις, ὥστε τῇ συνεχείᾳ λανθάνει τὸ μεθόριον αὐτῶν καὶ τὸ μέσον ποτέρων ἐστίν. μετὰ γὰρ τὸ τῶν ἀψύχων γένος τὸ τῶν φυτῶν πρῶτόν ἐστιν· καὶ τούτων ἕτερον πρὸς ἕτερον διαφέρει τῷ μᾶλλον δοκεῖν μετέχειν ζωῆς, ὅλον δὲ τὸ γένος πρὸς μὲν τἆλλα σώματα φαίνεται σχεδὸν ὥσπερ ἔμψυχον, πρὸς δὲ τὸ τῶν ζώων ἄψυχον. (*HA* 588b4-11)
>
> Nature proceeds by small steps from the soulless to the animals in such a way that their boundary and which of the two a borderline case belongs to is hidden due to the continuity. For the class of plants is first after the class of soulless things, and of these, the one differs from the other in seeming to have a greater share of life, and the entire class appears as if nearly ensouled in comparison to the other bodies, but as if soulless in comparison to the class of animals.[12]

This status for plants is based on their lack of capabilities for desire and perception, though Aristotle acknowledges that the division between plants and animals such as sponges is very blurry.[13] He believes that plants are essentially upside-down because they "eat" with their roots, which serve the function of mouths and heads (*De partibus* 686b35),[14] and have few parts because their needs are few (*De partibus* 656a1-3).[15] All in all, Aristotle views plants as simple

[11] Many references are collected and discussed by Sprague 1991, who argues in a tongue-in-cheek manner that plants are superior Aristotelian substances because they represent a unity of male and female, form and matter, in a single entity (225-226).

[12] See Sprague 1991 223-224.

[13] On this topic, see, e.g., Andersen 1976 on *De anima* 424a32-b3, concerning the question of whether plants can perceive form without matter; Murphy 2005 296, who gives a physiological account of why plants are unable to perceive; and Bos 2010 831-837, who attempts to fit plants on the *scala naturae* as a path to the "higher and purer" forms of life. Lloyd 1983 28n64 gives references to the "blurry" aspects of the line between animals and plants, especially *HA* 588b4ff. and *PA* 686b21ff., where a regression from animal to plant is imagined, during which the animal flips upside-down. See also Lloyd 1983 47ff., where he emphasizes that the presence of boundary-crossing species such as bats, seals, and anemones only serve to underscore Aristotle's categorical distinctions between different classes of beings.

[14] Plants are said to have their heads downward at *PA* 683b18 (κατὼ τὴν κεφαλὴν ἔχει) and to be upside-down at 686b33 (ἔχον τὰ μὲν ἄνω κάτω, τὰ δὲ κάτω ἄνω), *IA* 705b2, and 706b5. See Lloyd 1983 41-42 on the significance of Aristotle's use of man as the model when deciding what is κατὰ φύσιν or παρὰ φύσιν.

[15] Concerning Theophrastus' study of the τέλη of plant parts, Wöhrle comments (1985 85): "Daher folgt das auch für ihn die causa finalis im Pflanzensystem eine geringere Rolle spielen mußte, was, wie wir geseh haben, für den Aufbau des gesamten botanischen Werkes (keine Schrift über die Teile der Pflanzen) von Bedeutung ist." While it

and not worthy of much metaphysical reflection, at least in comparison with animals, and, especially, the human being. When he does think about plants in a deeper way, he declares that a plant's τέλος is producing another plant, via the production of seed.[16]

Yet the institution of agriculture remains unaddressed. How would Aristotle's teleological system account for a plant that needs human assistance to grow and reproduce? This is the question raised by Wardy in his 2005 article "The Mysterious Aristotelian Olive." He cites a fragment from Aristotle's *Protrepticus* (from Iamblichus, *Protrepticus* 50.2-8) that states that some seeds need farming in order to germinate (ἔνια [*sc.* σπέρματα] προσδεῖται τῆς γεωργικῆς τέχνης). Wardy further cites Aristotle's *Physics* to show Aristotle's belief that art either imitates or *completes* nature (199a15-17). In an attempt to follow Aristotle's thinking as expressed in these two passages, Wardy classifies cultivated plants as existing in a space between objects of nature and full-fledged objects of art: they are "living quasi-artefacts."[17] This question is never directly answered by Aristotle, but Wardy's interpretation is a likely one. From this classification, though, there arises a teleological problem: whose good is the plant aiming at? Is the production of fruit a τέλος? Aristotle does not answer these questions, aside from his anomalous remark in the *Politics* (1256b15-16) that plants exist "for the sake of animals" (τῶν ζῴων ἕνεκεν), which hearkens back to the ideas expressed in Plato's *Timaeus*.[18] For how an anthropocentric τέλος of a cultivated plant might be more rigorously explored, we must turn to Theophrastus.

---

is true that there is no *De partibus plantarum* by Theophrastus, this is no reason that teleology is less important to the study of plants. In fact, as I will discuss below, the lower prevalence of the final cause is due not to the lack of material, but to Theophrastus' developed views on the subject.

[16] See, e.g., *De anima* 415a27-29 and *GA* 731a25-29.

[17] Wardy 2005 75-6; 81.

[18] *Timaeus* 77c. See chapter 1.

4.1.2 Theophrastus and plant teleology

Much of Theophrastus' work in his two major botanical treatises concerns the descriptive science of plants.[19] He describes their fundamental parts (μέρη: root, stem, branch, and twig; *HP* 1.1.9), their principles (ἀρχαί: sap, fiber, veins, and flesh; *HP* 1.2.1), and their forms (εἴδη: tree, shrub, under-shrub, and herb; *HP* 1.3.1), each fourfold division being reminiscent of other such divisions in Greek science.[20] In addition, Theophrastus throughout describes plants as falling into two basic classes, domesticated and wild, and he details the disparate influences of nature (φύσις) and cultivation (νόμος or τέχνη) that are at work whenever someone decides to plant a garden. Finally, he is interested in the environment in which plants grow: where they are from and where they can be transplanted.[21] In the *CP*, however, his interests go beyond description and taxonomy and he does attempt to describe the τέλη[22] of plants. For Theophrastus, this always involves the production of the seed (σπέρμα) and fruit (καρπός), through which the plant reproduces and from which humans generally obtain nourishment. His clearest statement of this comes right at the beginning of the *CP*:

> ἡ γὰρ φύσις οὐδὲν ποιεῖ μάτην, ἥκιστα δ' ἐν τοῖς πρώτοις καὶ κυριωτάτοις, πρῶτον δὲ καὶ κυριώτατον τὸ σπέρμα· ὥστε τὸ σπέρμα μάτην ἂν εἴη μὴ δυνάμενον γεννᾶν, εἴπερ τούτου χάριν αἰεὶ τὸ σπέρμα καὶ πρὸς τοῦτο πέφυκεν. (*CP* 1.1.1)
>
> Nature does nothing in vain, least of all concerning things that are primary and most essential. The seed is primary and most essential. Therefore the seed would be in vain if it were unable to generate, since the seed exists by nature for this purpose and with this aim.

[19] The *HP* has been characterized as a collection of *differentiae*, on the model of Aristotle's *HA*, but at an earlier stage of research (Gotthelf 1988 118-120).

[20] E.g., four elements, four humors.

[21] As noted by Lloyd 1984 352 and Wardy 2005 84-6. A similar breakdown of Theophrastus' interests is presented in Einarson and Link 1976-1990, vol. 1 xiv-xix.

[22] Theophrastus never uses the plural of τέλος in reference to plants, but it is clear from his writing that he did not share Aristotle's simplistic view of their final cause.

The final cause of plants is expressed in absolutely standard language: with regard to reproduction, plants exist and function τούτου χάριν and πρὸς τοῦτο.[23] However, following this opening statement he describes a number of problems that arise from the differences in fruit-ripening and seed-production between wild and cultivated individuals of the same plant species.[24] These questions drive Theophrastus to seemingly set out a double τέλος for plants, expressed as two kinds of ripening (πέψις):

> ἴσως δ' αὐτὸ τοῦτο πρότερον εὖ ἔχει διελεῖν, ὅτι πέψις ἐστὶν ἡ μὲν οὖν τῶν περικαρπίων, ἡ δ' αὐτῶν τῶν καρπῶν, καὶ ἡ μὲν πρὸς τὰς ἡμετέρας τροφάς, ἡ δὲ πρὸς γέννησιν καὶ διαμονὴν τῶν δένδρων, οἱ γὰρ καρποὶ καὶ τὰ σπέρματα τούτων χάριν. (*CP* 1.16.1)
>
> Perhaps it is best to divide what was said previously: there is one ripening of the pericarp and another of the fruit itself. The first is for our nourishment and the second for the procreation and continuation of the tree, since the fruits and seeds serve these purposes.

Instead of τούτου χάριν in the passage above, here we have τούτων χάριν: there are multiple purposes to the seed and fruit.

Theophrastus acknowledges that these two ripenings are sometimes in conflict with each other: for instance, a plant's production of seed for reproduction may be thwarted by harvesting it for food. To mediate this problem, agriculture came about:

> πρὸς ὃ δὴ καὶ ἡ γεωργία μεμηχάνηται, κωλύουσα τὴν τούτων αὔχησιν καὶ τροφήν. ἅπαν γὰρ (ὡς εἰπεῖν) καὶ ἥμερον ἀγρίου καὶ γεωργούμενον ἀγεωργήτου καὶ κάλλιον εἰργασμένον τοῦ χεῖρον, μίκρουπυρηνότερον ἀνυγραινόμενόν τε μᾶλλον καὶ τὴν τροφὴν περισπῶν εἰς τὸ περικάρπιον, ἔτι δὲ τοὺς χύλους ἐκπεπαῖνον εἰς συμμετρίαν τῆς ἡμετέρας χρείας. (*CP* 1.16.2)

[23] For the importance of the phrases τούτου χάριν and πρὸς τοῦτο in setting out Theophrastus' teleology, see the passages collected in Wöhrle 1985 85-88.

[24] Theophrastus' particular interest in technology, broadly defined (human intervention in the natural world: agriculture, wood production, medicine, etc.) has been noted by Wöhrle 1988 8 in both the *De odoribus* and the *CP*. This is more evidence of Theophrastus' split perspective when looking at plants: they have to serve both the ends of nature and the ends of their human masters.

> For this [*sc.* the conflict of the two ripenings] agriculture has been developed, which checks the growth and nourishment of these [seeds for generation]. Universally (so to speak), when a cultivated plant is compared to a wild one, a tended one to an untended, and a better worked one to a worse, it has a smaller seed, is juicier, and diverts its nourishment to the pericarp. Furthermore, it completely ripens its juices in accordance with our needs.

This conclusion creates problems of its own. Which of these two πέψεις is primary? Which represents the true φύσις of the plant? Plato's brief account in the *Timaeus* (see chapter 1) would imply that a plant's drive toward generation came first, and human effort, applied later, resulted in cultivated varieties. Aristotle's frequent statements that a plant's τέλος is fulfilling its capacity for reproduction would lead in this direction as well. Theophrastus, too, seems to be in agreement by talking about the "development" of agriculture. If agriculture was not always present, a plant's primary τέλος must be its own reproduction, independent of human intervention. However, this is not what Theophrastus means, as he soon makes clear. He first acknowledges the problem from the perspective of the plant scientist:

> πότερα τὴν φύσιν ἐκ τῶν αὐτομάτων μᾶλλον θεωρητέον ἢ ἐκ τῶν κατὰ τὰς ἐργασίας, καὶ ἐν ποτέροις τὸ κατὰ φύσιν; (*CP* 1.16.10)
>
> Should we observe the nature [of plants] from those that grow of their own accord, or rather from those that grow by human effort, and in which of the two is the growth according to nature?

His solution to the problem is that *both* kinds of growth and ripening are κατὰ φύσιν, depending on the variety of plant:

> τοῖς μὲν γὰρ ἡ αὐτόματος ἡ οἰκειοτέρα, τοῖς δ' ἡ τῆς θεραπείας καὶ γεωργίας, ἔνια δ' ἀμφοτέρως, ἐξ ὧν καὶ θεωρητέον, ὥσπερ καὶ ἡ φύσις διῄρηται ἡμέροις καὶ ἀγρίοις, ὁμοίως ἔν τε ζῴοις καὶ φύτοις· ἑκατέροις γάρ ἐστιν φυσικὰ καὶ οἰκεῖα, καὶ πρὸς σωτηρίαν καὶ πρὸς διαμόνην, καὶ πρὸς αὔξησιν καὶ βλάστησιν, καὶ πρὸς τὴν τῶν καρπῶν γέννησιν. (*CP* 1.16.13)
>
> For some plants, a nature that is spontaneous is more suitable; for some, a nature based on care and tending; and some have it both ways. We should investigate based on this, as their natures are distinct for cultivated and wild, similarly in animals and in plants. The two types each have that which is natural and suitable for self-preservation and

> continued existence, for growth and putting out shoots, and for the production of fruits.

What is clear is that in Theophrastus' conception cultivated plants can have two kinds of φύσις and τέλος: to produce fruit (and seeds) for their own reproduction and to produce fruits for human use. This second τέλος requires human intervention (τέχνη) in the form of agriculture to achieve it.[25]

Does this double τέλος signal a significant break from Aristotle?[26] If so, what is the value of Theophrastus' novel theory? Some scholars would answer these questions "no" and "none." They first note that the fact that the concept of a final cause is barely present in Theophrastus' botany, and thus these examples are not enough to make one believe that he disagreed with Aristotle.[27] Then they point out problems in using the passages I have cited from *CP* 1.16. First, they may not refer to a plant's actual final cause because Theophrastus does not use the word τέλος or its derivatives in these passages, but does use these words consistently with reference to the seed.[28] Thus Wöhrle concludes his study on Theophrastus' teleology: "An keiner der angefuehrten Stellen ist davon die Rede daß die Menschen das Ziel der Pflanzen im Sinne einer erweiterten Finalität seien; Ziel der Pflanzen sei vielmehr die eigene Reproduktion."[29] Wardy is not so harsh in his assessment. He is right to note that Theophrastus is uncomfortable with Aristotle's teleological model, but he states that the

[25] Hughes 1988 67-8 expresses this same idea in a different way: Theophrastus is interested in the relationship between three different "natures": the plant's, the environment's, and that imposed by the grower. The fact that none of these is predominant and, in fact, they require each other, shows a break from Aristotle's teleology of plants.

[26] Unfortunately, Amigues's new Budé of the *CP* (2012—) lacks relevant notes on these intriguing passages.

[27] For this view, Wöhrle 1985 85: "daß die untergeordnete Bedeutung der causa finalis in den botanischen Schriften des Theophrast nicht mit einer allgemeinen Kritik an der Teleologie des Aristoteles in Verbindung gebracht werden kann."

[28] See Wöhrle 1985 89-90 for a collection of such passages.

[29] Wöhrle 1985 93. This erases any difference between Theophrastus and Aristotle.

development of a double φύσις is mere "sophistical ingenuity" and does not solve any problems.[30] Sharples does call Theophrastus' changes "developments and modifications within the Aristotelian framework" but does not see them as "the replacement of it by a different perspective altogether."[31] This is on the right track, but I believe that these passages should not be viewed so lightly. When we turn to another of Theophrastus' works, we find more evidence for originality in his thought.

A good place to look for an answer to whether Theophrastus shared Aristotle's beliefs on teleology and purpose in nature, particularly as they relate to plants, would be in the brief text that has come down to us under the name *Metaphysics*.[32] Here, Theophrastus repeatedly questions the necessity of final causes, and wonders if one should postulate that things instead happen by "necessity" (ἀνάγκῃ τινί) or by chance (κατὰ συμβεβηκός at 6a9-10; συμπτωματικῶς at 10a22). To take one of many examples, he states near the end of the treatise that even the primary elements may not obey teleology:

> φαίνεται δὲ καὶ ἐν τοῖς πρώτοις ἐπιθεωρούμενα πολλὰ καὶ ὡς ἔτυχεν, οἷον τὰ περὶ τὰς τῆς γῆς λεχθέντα μεταβολάς· οὔτε γὰρ τὸ βέλτιον οὔτε τὸ τινὸς χάριν, ἄλλ' εἴπερ,[33] ἀνάγκῃ τινὶ κατακολουθεῖν· πολλὰ δὲ καὶ ἐν τῷ ἀέρι τοιαῦτα καὶ ἐν ἄλλοις. (*Metaphysics* 11b12-17)
>
> Even among the primary things many appear, when observed, just to occur randomly, for example what has been said about the changes of the earth. These are not "better" or "for the sake of something," but, if anything, appear to follow some necessity. There are many things of this sort in the air and in other places.[34]

---

[30] Wardy 2005 79-81.

[31] Sharples 1995 127.

[32] On the name of the text, see Gutas 2010 9-32, who argues strongly that it was originally called Περὶ ἀρχῶν.

[33] For the meaning of ἀλλ' ἔιπερ as "but, if anything," see van Raalte 1993 *ad* 7b13, where she collects parallel passages from Aristotle and the *CP*.

[34] With this should be compared the passage at 10a22-28, which states a similar view and makes explicit that both chance and necessity are involved in most things on earth (ἐν τοῖς περὶ τὴν γῆν πλείοσιν).

In particular, Theophrastus has qualms about ascribing final causes to plants and animals:

> χαλεπὸν δὲ πάλιν αὖ τὸ τοὺς λόγους ἑκάστοις περιθεῖναι πρὸς τὸ ἕνεκά του συνάγοντας ἐν ἅπασιν—καὶ ἐν ζῴοις καὶ φυτοῖς καὶ ἐν αὐτῇ πομφόλυγι—πλὴν εἰ συμβαίνει τῇ ἑτέρων τάξει καὶ μεταβολῇ μορφάς τε παντοίας καὶ ποικίλας γίνεσθαι τῶν περὶ τὸν ἀέρα καὶ τὴν γῆν. (*Metaphysics* 7a19-7b2)
>
> Again, it is difficult to assign accounts to all things by drawing in every case toward a "for the sake of which," in animals and in plants and in the very bubble, unless it happens that the manifold and diverse forms of the things in the sky and on the earth arise by the arrangement and change of other things.[35]

On the surface it appears that Theophrastus is casting grave doubt on aspects of Aristotle's metaphysics and teleology, particular as it relates to animals and plants. But, if we want to export these beliefs to compare with those from the *CP*, we must answer the questions of whether the *Metaphysics* contains sincere doubts or dialectical talking points, and when in his career Theophrastus wrote it.

These questions about the text have proved difficult to answer, despite the enormous amount of scholarly attention it has received.[36] First, its date is unclear. Did Theophrastus write it as a kind of school exercise while Speusippus was the head of the Academy and Aristotle was still developing his metaphysical theories?[37] Or was it written by the mature scholar, as a response to the full range of his teacher's first philosophy?[38] This is a fraught question, because the temptation for circular reasoning based only on internal evidence is

[35] The "bubble" likely refers to the bubble of generation "the smallest entity consisting of matter plus form" (van Raalte 1993 *ad loc.*).

[36] "In sheer numbers of pages of study and commentary in proportion to the dozen or so full pages of Greek text, the attention it has commanded is impressive, if not unique" (Gutas 2010 xiii).

[37] This is a common view, held, e.g., by Vallance 1988 27ff., who believes that Theophrastus is defending orthodox Aristotelianism against Speusippus and Plato.

[38] For a summary of arguments on both sides of the debate, see Gutas 2010 1-9, who believes it is a very early work that Aristotle responded to in the later books of his *Metaphysics* and biological writings. Regardless of its dating in relation to Aristotle, it is clear that it precedes Theophrastus' botanical works, at least in the state we have them, as these were revised up until near the end of Theophrastus' life (see below).

very strong. Gutas's view, based on a scholion to the text, that the text is structured on 25 ἀπορίαι and their exposition is persuasive.[39] From the text's laconic nature and lack of external reference, van Raalte believes that it was for the "private use" of the author.[40] Lennox believes that Theophrastus is "forcing us into *aporia* about teleology" by providing examples of cases that would be difficult for Aristotle to account for (male breasts, antlers on male deer, etc.)[41] An external solution to these problems could be found if we had other evidence of Theophrastus' beliefs on metaphysics and teleology that could be compared with what is found in the *Metaphysics.*

I believe this external evidence is provided by the passages from the *CP* that I cited above. Since similar concerns as to the possibility of a single final cause underlie these botanical passages, and since the *CP* is securely datable in its final form to the late part of Theophrastus' life (see below), I believe that the doubts Theophrastus raises in the *Metaphysics* are real, and that, although we do not have a full-length treatise on teleology by him, we can conclude that his views diverged from Aristotle's. Theophrastus' *Metaphysics* "betrays a certain preoccupation ... with the concept of a whole, its parts, and the way they relate to one another,"[42] and this interest is taken over into his botanical works. Even though he never produced a *De partis plantarum*, his interest in the τέλη of individual plant parts is well attested.[43] His flexibility with the Aristotelian final cause, as shown in the *Metaphysics*, appears

[39] Gutas 2010 38-43.

[40] van Raalte 1993 8-9.

[41] Lennox 1985 149.

[42] van Raalte 1993 25.

[43] These references are not overwhelming, but are certainly present, as Wöhrle himself shows (1985 85-88). Vallance 1988 31 mentions frequent positive assertions of teleology in the botanical works, but does not provide any examples. On the other hand, Lennox 1985 162n47 notes a relative absence of A ἕνεκα B and A διὰ τὸ βέλτιον

clearly in his mature works. True, when he references a τέλος explicitly in the botanical works, it is typically the Aristotelian final cause of reproduction, but elsewhere in his texts, the purpose of plants is often to serve humans. In these cases the double τέλος of plants is constantly in view as Theophrastus discusses the importance of the human end for plants through the use of technologically imposed means (τέχνη).[44]

I have presented the evidence here in a way that shows how the botanical question of the τέλος of plants can be elucidated by looking at Theophrastus' *Metaphysics*. In the course of this, I have glossed over the question of the date of the latter text, since it is irrelevant: the *CP* is certainly late, so the date *Metaphysics* does not matter, because its contents jibe with the *CP*. If the *Metaphysics* is early, then Theophrastus imported doubts about Aristotelian final causation to his botanical work. If the *Metaphysics* is late, then Theophrastus' doubts may have crept up as his descriptive and taxonomic work was already well underway, since research for the *HP* and *CP* was certainly already in progress during Theophrastus' exile from Athens between 347 and 335 (see below). I will suggest here as a hypothesis that the latter is the more correct view. As Theophrastus was more and more exposed to the ways plants grow and are grown, his once-devout ideas about final causation were altered. Studying plants and the ways human τέχνη is involved in their growth made Theophrastus acknowledge that the reality of final causation is more complicated than Aristotle's view. And a good amount of the information Theophrastus was sifting through in his plant researches concerned the flora of the exotic east. As we will see in the next section, his reaction to new data is frequently to

---

constructions in Theophrastus, when compared to Aristotle. Another opposing view is provided by Gotthelf 1988 122-3, who believes that the causal inquiry of the *CP* is limited to efficient causes (of generation, etc.) rather than final causes. Gotthelf believes that the *CP* is in reality Theophrastus' "*De generatione plantarum*."

[44] Amigues 2012— vol. 1 x makes the similar point that the structure of the *CP* is based on a "dichotomie dans le traitement du sujet qui n'exclut pas les empiètements réciproques et apparaît comme une commodité méthodologique dans la mesure où la nature (φύσις) et l'art (τέχνη), loin de s'opposer, concourent au même but."

declare that more investigation is required: ταῦτα ὁποτέρως ἔχει σκεπτέον. Exotic plants raise problems for him, and his struggles with this new data on plants and the relationships humans have with them could well have been a major cause for his revision of Aristotle's teleology.[45]

4.2 An influx of information

In his botanical investigations, Theophrastus discusses plants from all over the known world. My project is concerned primarily with his treatment of plants from the farthest reaches of the east, but, I will introduce Egypt as a *comparandum* as a way to get at differences in how Theophrastus received and processed new information. In one sense, Egypt, recently conquered by Alexander, was a new land to the Greeks, but it was also one with which the Greeks had longstanding contact. In addition to this reason for using Egypt, the two lands were often set against each other in ancient sources. For instance, Onesicritus explicitly set out to make this comparison—and to promote India over Egypt.[46] To achieve this he went so far as to attribute hippopotamuses to the rivers of India.[47] Additionally, Strabo attributes papyrus to India (17.2.4).[48] Thus, even though Egypt was relatively well-known, there was a tendency to extend its marvels to the other end of the marvelous world: India.

The precise extent of the commercial and cultural relationship between pre-classical Greece and Egypt is a matter of dispute,[49] but it is clear that at least by the late seventh century

[45] I admit that I cannot prove this hypothesis, but it is a useful way to approach Theophrastus' thought to explore how much the new information from the east challenged the intellectual structures Aristotle left behind.

[46] For Onesicritus' program see Brown 1949 59, 81, and esp. 95ff.; Pearson 1960 107.

[47] *BNJ* 134 F 7 (= Arrian, *Indica* 6.8).

[48] See Parker 2008 111 on Strabo's use of Egypt and India.

[49] For an overview of the dispute over the extent of Greco-Egyptian contact in the early period, see Burstein 1996.

trade between Greece and Egypt was thriving, mostly via the port of Naucratis.[50] In this city Greeks from Miletus, Cyprus, Aegina, Samos, and Rhodes lived and traded: grain, linen, and papyrus were exported to Greece, while Greek wine was imported.[51] For example, we have a report in Herodotus that Sappho's brother Charaxus came to Egypt and freed the courtesan Rhodopis (2.135), and Strabo elaborates that he was in Egypt on a mission to trade Lesbian wine (17.1.77). Sappho 5 has been thought to refer to her brother, but there was no authority older than Herodotus for the name Charaxus. However, in one of her poems that has recently come to light,[52] Sappho does address her brother by name, bolstering Herodotus' story of the connection between Lesbos and Naucratis. Because of this longstanding mercantile contact, the land and flora of Egypt became somewhat familiar to Greeks by the time of Theophrastus.[53] On the other side of the *oikoumenê*, Alexander had only recently reached the Indus Valley, and first-hand scientific reports were a novelty. The earlier accounts of Herodotus and Ctesias relied on hearsay from traders and travelers and did not contain much scientific information

[50] The site benefited from an excellent location: direct water routes to both Memphis and the Mediterranean, and an overland trade route passed through (Smith 1926 153). Naucratis was not a true Greek "colony" (ἀποικία), or even a πόλις, but rather a trading post. The stories of its foundation by Milesians (given by Strabo 17.1.18ff.), have been rightly labeled as Hellenistic invention by Möller 2001 16-18. Herodotus' story of the Egyptian king Amasis limiting Greek trade to Naucratis (2.197) is more likely the correct one.

[51] See Smith 1926 153-154 and Braun 1982 39-40, who cites Bacchylides F 20B in support of the early wheat trade: πυροφόροι δὲ κατ'αἰγλάεντα πόντον /νᾶες ἄγουσιν ἀπ' Αἰγύπτου μέγιστον /πλοῦτον. Herodotus 2.77 testifies to the lack of wine from Egyptian grapes (2.77), though in 2.37 he reports that the priests receive οἶνος ἀμπέλινος as part of their daily rations. Lloyd 1975-88 *ad* 2.77 comments that "there is no real contradiction here," since Egyptian-made wine was rare and expensive. The wine in question could of course have been imported.

[52] Obbink forthcoming.

[53] A major factor in this was the diversity of Naucratis' inhabitants, especially if we take a network-theory view of the Mediterranean. The city was a mixing place where connections between Greeks from different nodes were formed, allowing the spread of a common "Greekness" from a point on the frontier of the Greek world. See Malkin 2011 59. These connections would allow the spread of knowledge about Egyptian flora to happen with much greater efficiency.

about Indian flora.[54] In the year 330, say, India was very still very much out of reach and remained nearly as exotic for Theophrastus as it had been for Herodotus. By 290, near the end of Theophrastus' life, information from the east was more accessible and had begun to be incorporated into his work. We can see this in the way Theophrastus discusses the plants native to Egypt and India. But before entering into Theophrastus' data, I should discuss two questions that are fundamental for understanding his use of this information. When and how were his botanical works composed? And, how does he organize this information in his texts?

4.2.1 Date and composition

First I will take up the question of the date of Theophrastus *HP* and *CP*. Theophrastus had a long life: 372/1 or 371/0 to 288/7 or 287/6, and thus a long career.[55] Based on first-hand observation from Lesbos and the Troad, it is clear that the research for his botanical works was underway when he was Aristotle's student (or junior colleague?) and partner in exile (347-335), but it is not clear that the project was committed to writing at this early stage. The traditional dating for Theophrastus' botanical works is the archonship of Nicodorus, 314/3 BCE, based on remarks by Pliny, who states that Theophrastus gave a measurement of 80 stades for the circumference of the island of Circeii *in eo volumine, quod scripsit Nicodoro Atheniensium magistratu* (*NH* 3.58). This measurement occurs in *HP* 5.8.3 in a description of the lands of the Ῥωμαῖοι, but Theophrastus' reference to Nicodorus is at *CP* 1.19.5 (see Pearson 1960 233 with

[54] Ctesias' *Indika* dates from the late 5th/early 4th century, but relies on second-hand information, likely reported orally by travelers and traders. Ctesias visited much of Persia but never claims to have visited India. Furthermore, he was writing in and influenced by the existing Greek tradition of Skylax, Hecataeus, and Herodotus, though did not merely copy what they had said. See Lenfant 2004 cxliii-clii and Nichols 2011 18-27 on the sources and intellectual background for his *Indika*. See also chapter 2 for these as ethnographic texts.

[55] Diogenes Laertius says he lived to be 85 (5.40), which is the basis of his accepted dates. As Hort 1916-1926 vol. 1 xxiii rightly notes, the claim in the preface to the *Characters* that the author is writing in his 99th year is likely spurious.

note 39).[56] However, as Amigues notes, there are references in the *HP* to events past that date.[57] Einarson and Link in their Loeb edition of the *CP* collect a somewhat (though not completely) overlapping list of dated events.[58] Amigues's inference (similar to that of Einarson and Link) is that the *HP* and *CP* are part of a "série de cours" that had an initial publication in 314/3, but continued being revised "jusqu' à la mort de Théophraste." The last datable reference (agreed upon by both Amigues and Einarson/Link) is at *HP* 4.8.4: ὅθεν [*sc.* of papyrus] καὶ Ἀντίγονος εἰς τὰς ναῦς ἐποιεῖτο τὰ σχοινία. Antigonus was at war with Ptolemy (who cut off papyrus supplies) from 315 until his death at Ipsus in 301, so the passage (with its use of the imperfect ἐποιεῖτο) should be dated after that. The *terminus ante quem* for the *HP* is the author's death in 288-6 BCE.[59]

Adding to the confusion about the dates of Theophrastus' works are the hypotheses of various scholars that multiple editions of the *HP* (and sometimes of the *CP* as well) were in circulation simultaneously. The reasons for these claims are the following: 1) Diogenes Laertius gives 10 books for the *HP*, but the tenth book of the best manuscript (U, Vatican Urbanus Gr61) contains as book 10 a partially mutilated repetition of book 9. Modern editors incorporate what is different of book 10 into book 9 and print editions with only 9 books.[60] 2) Some references to and quotations of the *HP* in other ancient sources give incorrect book

[56] Based on the seeming confusion here, Fraser suggested (1994 185-186) that Pliny is referring to a reference in Theophrastus' lost Ἱστορία Ὑπομνήματα rather than to the *HP* or *CP*.

[57] Amigues 1988-2006 vol. 1.xviii-xx.

[58] Einarson and Link 1976-1990 vol. 1.viii.

[59] For more on the dating of these texts, see Sharples 1995 154-155.

[60] See Sollenberger 1988 15-16, Sharples 1995 128-130, and Amigues 1988-2006 vol. 1 xli-liv.

numbers, which seem to imply that the current books 8 and 9 were once 7 and 8.[61] Sharples 1995 129-130 summarizes the various suggestions that have been made to account for this: Schneider suggested that book 4 was originally 2 books, Thompson (followed by Sollenberger 1998) that book 9 was originally 2 books. and Regenbogen had the idea that a first edition omitted books 4 and 5 but split book 2, yielding 8 books, though his idea has been dismissed by Keaney and Amigues. I list these views not to claim that I know which is correct, but merely to point out the complicated picture the modern text presents. From all of this, one thing is clear: there were multiple redactions of the *HP* over a length of time, and during this period, Theophrastus had ample opportunity to incorporate new information or make changes to the existing text.

Now I will turn to the question of Theophrastus' sources.[62] Some of the information in the *HP* and *CP* is certainly from Theophrastus' first-hand observation and research. This includes much of the material concerning the island of Lesbos (his birthplace) and the places he visited with Aristotle in the period between Plato's death in 347 and the establishment of the Lycium in 335 (particularly the Troad and Stagira),[63] though he may have visited other places in the Mediterranean.[64] But when Theophrastus does not have first-hand experience, he is quite willing to use others' information. This comes in two types: second-hand information:

---

[61] Sharples 1995 129.

[62] For Theophrastus' sources in general, see Amigues 1988-2006 vol. 1.xx-xxx.

[63] Amigues 1988-2006 vol. 1.xv suggests that the κῆπος mentioned in Theophrastus' will (preserved by Diogenes Laertius 5.52-55) might have been a full-fledged botanical garden, a place for experimentation with exotic seeds and cuttings. Even if this is so, there is no reference to this kind of research program in the *HP* or *CP*.

[64] Capelle 1954 172-173 raises the possibility that Theophrastus may have made his observations of Libya first-hand. Amigues 1988-2006 vol. 1.xiii-xiv follows him in speculating that Theophrastus may have visited Crete, Egypt, or Cyrene either when he was forced, along with the other philosophers, to leave Athens in 318 at the command of Sophocles, son of Amphiclides (Diogenes Laertius 5.37) or earlier, when Aristotle was head of the Lycium. In either case, she admits that it is impossible to know whether the observations were Theophrastus' own or of some other "naturaliste compétent."

the oral or written reports of either locals or investigators sent by Theophrastus, and what I will call "third-hand" information: reports that were not directly related to Theophrastus' research program and may have dealt with botany only incidentally. Theophrastus' openness to multiple sources of information is shown through his use of the accounts of root-cutters, a group with very shaky scientific credentials, in his work.[65] Despite the presence of numerous sources of information, their names are often unknown, as Theophrastus neither obliges us with a list of sources as later authors of technical treatises (such as Pliny) were wont to do, nor does he always mention the name of the particular source he is using at any given moment. He does mention some individual names. For example, he obtained second-hand information from Satyros, who investigated plants in Arcadia (*HP* 3.12.4), and the people of Mt. Ida (οἱ περὶ τὴν Ἴδην; *HP* 3.8.2); and third-hand information from several Presocratic philosophers, as well as the agricultural writers Menestor (*HP* 1.2.3; 5.3.4; 5.9.6; *CP* 6.3.5), Hippo (*HP* 1.3.5; 3.2.2), and Androtion (*HP* 2.7.2; 2.7.3; *CP* 3.10.4), and Alexander's general Androsthenes (*CP* 2.5.5).

For the flora of India, much knowledge arrived with the reports of the Alexander historians. The explanations and analyses that Theophrastus produced using the raw data from the east often show a level of understanding and insight that is not present in the historians themselves, raising the question of whether additional scientific reports were written by Alexander's companions. It used to be assumed that Alexander's expedition included natural scientists and that he sent back information (and possibly specimens) to his teacher Aristotle. The major ancient source for this view is Pliny the Elder:

> Alexandro Magno rege inflammato cupidine animalium naturas noscendi delegataque hac commentatione Aristoteli, summo in omni doctrina viro, aliquot milia hominum in totius Asiae Graeciaeque tractu parere iussa, omnium quos venatus, aucupia,

[65] See, e.g., *HP* 9.17 for Theophrastus' references to the root-cutter Thrasyas and the herb-seller Eudemus. Lloyd 1983 119-121 traces the origins of "root-lore" in Greek texts from Homer and Hesiod to the ῥιζοτόμοι, who then are used by both Theophrastus and by Hippocratic physicians.

> piscatusque alebant quibusque vivaria, armenta, alvaria, pisciniae, aviaria in cura erant, ne quid usque genitum ignoraretur ab eo. (*NH* 8.44)
>
> When Alexander the Great was king, his desire for learning about the natures of animals was kindled, and he assigned this study to Aristotle, a man of highest learning in every field. So, some thousands of men from the expanse of all of Asia and Greece were placed under his command: all those who got their living by hunting, birding, or fishing, and those who cared for animal parks, herds, beehives, fishponds, and aviaries, in order that he might not omit any begotten creature.

The historicity of this account has been called into question in recent times, especially the idea of a direct connection between Aristotle and Alexander.[66] Nevertheless, by the time Theophrastus was writing his *Historia plantarum* (mostly during the reign of Seleucus I) it is clear that scientific knowledge about plants was reaching Greece from the east, whether through official or unofficial channels. But when Theophrastus deals with plants from outside the traditional Greek world the only source he names is Androsthenes, a trierarch of Alexander's who explored the coast of Arabia (*CP* 2.5.5).[67] There are certainly many possible candidates for the remainder of his information. It is likely that the peripatetic Callisthenes made observations on behalf of the Lyceum, and it is likely that Theophrastus had access to records that Callisthenes had written concerning Egypt and Asia before his execution in Bactria.[68] This was before the expedition turned south toward India, however, so Callisthenes could not have given information on that region's flora. Additionally for Egypt, it is likely that

[66] Romm 1989 gives a negative assessment of Alexander's "scientific mission." Specifically, Romm believes that the elephant described by Aristotle was probably from Africa, not Asia. Karttunen 1989 94-95 has a more nuanced picture. He believes that Alexander's elephant was in fact from Asia, but that it can be traced to Ctesias, and not to Alexander. Karttunen states that Alexander, who "knew how to maximize the scientific and propaganda value of his campaigns" did indeed bring scientists to the east, but that their reports probably arrived too late to be taken into consideration by Aristotle in his works on natural science. See also Fraser 1994 174 for a more credulous view.

[67] Androsthenes' few fragments and testimonia are collected as *BNJ* 711.

[68] Theophrastus apparently wrote a treatise about Callisthenes: Καλλισθένης ἢ περὶ πένθους (Diogenes Laertius 5.44). For Callisthenes in general, see Pearson 1960 22-49 and Pédech 1984 15-69.

Theophrastus was able to draw upon Hecataeus of Abdera's *Aegyptiaca*.[69] Perhaps these sources would have been sufficient for Egyptian flora, but the farthest east (India) has no obvious source.

For his sections on India, it is relatively clear that he used some, if not all, of the Alexander historians, notably Aristobulus, Onesicritus, and Nearchus. The question of Theophrastus' sources on India has been of interest to many, but not for the same reason it interests me. Most scholars are more interested in figuring out relationships between Alexander historians, and they use Theophrastus to argue that he seems to follow Onesicritus (or Aristobulus as the case may be). They generally are not interested in Theophrastus himself or in his process of composition, taking the *HP* and *CP* as monolithic monographs with a single edition, rather than as lectures that evolved over the author's long life and career. Even scholars who are interested in Theophrastus' process can be caught in this trap.[70] Theophrastus' long life further complicates matters, since he was writing and revising his botanical works during the same general period that Onesicritus, Nearchus, and Aristobulus were publishing their accounts of Alexander and his expeditions, which included remarks on India. Because of this, his relationship with sources on India is more complex than scholars have realized: when he began to write, very little information about the Far East was available, but as he continued to modify and expand the *HP* and *CP*, he incorporated more information from sources that were newly available. I will present my view of Theophrastus' use of sources

[69] For this possibility, see originally Jaeger 1938 123-153, who dates the *Aegyptiaca* to post-305 and asserts that Theophrastus in his *De lapidibus* used Hecataeus when discussing the Jews. Murray and Stern 1973 present two different arguments against this: first Stern states that the *De lapidibus* must be dated to 315/4 due to a reference to the archonship of Praxibulus, and thus the *De lapidibus* is not dependent on Hecataeus; Murray agrees with Stern's date for the *De lapidibus*, but instead pushes Hecataeus' date back to between 320 and 315 to agree with Jaeger in giving Hecataeus priority in discussing the Jews. See also Cole 1999 160n35 who states that the *Aegyptiaca* "was the most up-to-date source of information on Egypt in Theophrastus' day, and it would have been natural for him to use it."

[70] Fraser 1994 172, for instance, assumes a single "edition" of the *HP* which was followed by a single *CP*.

on India later in this chapter, after my discussion of the relative place of Egypt and India in his treatises.

4.2.2 The context of *Historia plantarum* book 4

Before beginning this comparison, however, I should give an overview of where this evidence is found in the works of Theophrastus, and how he organizes it. Most of the information on India and Indian plants is found in the *Historia plantarum*.[71] A few words about its general organization will suffice. In general, the *HP* is structured thematically, with different topics for each of its nine books.[72] The topics discussed in these books are: 1) The parts and classification of plants in general, 2) Plant reproduction and propagation, 3) Non-cultivated trees, 4) Plants specific to various geographical or ecological regions, 5) Types and uses of wood, 6) Under-shrubs (τὰ φρυγανικά), 7) Herbs and grasses, 8) Cereals and pulses, 9) Plant juices and their uses. From this survey, it is apparent that Theophrastus made use of several systems of classification, though the most common scheme is to separate discussion based on a specific kind of plant:[73] books 3, 6, 7, and 8 are structured on this principle. Another guiding factor is the parts and/or functions of the plants. Books 2, 5, and 9 (on reproduction, wood, and juices) are of this type.[74] Of the books that remain, book 1 is introductory and

[71] See below for my interpretation of the relative lack of references to India in the *CP*.

[72] See Senn 1956 5-42 for a different account of the organization and composition of the *HP*.

[73] *HP* 1.3 describes the essential division of plants into four categories: tree (δένδρον), shrub (θάμνος), under-shrub (φρύγανον), and herb (πόα).

[74] See Gotthelf 1988 113-116 for parallels in organization to Aristotle's *HA*. Gotthelf feels that the *HP* is "less sure" in its organization, because the guiding principle is sometimes a kind of plant (tree, cereal) and sometimes a plant feature (root, growth in water). He opposes this to Aristotle's consistent arrangement by feature. Lloyd 1983 43 (with note 170) states that Theophrastus tried to structure his taxonomy by using the tree as the pinnacle of botanical development, much as Aristotle used the human male, but this was ultimately a failure and led to "taxonomical anarchy" in the *HP*.

therefore not readily categorized and book 4 contains plants that are grouped together based on features of their environment rather than on their own qualities. The implications of the unique arrangement found in book 4 are explored below.

Book 4 contains discussions of plants from different physical environments, whether these are geographic (Egypt, Thrace, etc.) or ecological (plants that grow in rivers, lakes, seas, etc.). Because its organizing principle is different from that of the other eight books, it is a kind of miscellany, a collection of curiosities from the plant world, and its structure is correspondingly loose. In the first section, Theophrastus gives a general survey of the effects of climate and location on the growth of familiar plants. Then he proceeds to discuss plants peculiar to Egypt (4.2); Libya (4.3); Asia, including India (4.4); and the northern regions (4.5). There is then a transition to aquatic plants, and Theophrastus discusses the plants from the Mediterranean (4.6), the seas at the end of the earth, including the Atlantic and the Persian Gulf (4.7); and then from rivers and marshes in specific locations (4.8-4.9) and in general (4.10-4.12), a discussion which digresses to cover thoroughly rushes and reeds and their uses.[75] From aquatic plants, Theophrastus continues to discuss longevity of plants, diseases that affect them, and some types of harm humans can do to plants (4.13-4.16).

In the first section of book 4, Theophrastus outlines the general relationship between plants and their natural environment. Two features of this discussion stand out. The first is that each plant seems to have an ideal situation: some plants like hot and sunny conditions, and some like shady (4.1.1); some like the plains, and some like the mountains (4.1.4). For a specific example, the yew is very pleased to grow in thickly shaded regions (χαίρει δὲ σφόδρα καὶ ἡ μίλος τοῖς παλισκίοις: 4.1.3). The second feature is that there are some overriding

[75] This portion of book 4 is structured similarly to those books that center on a specific type of plant.

aspects that affect all kinds of plants, regardless of their specific preferences. These include the exposure, the density of their growth, and the amounts of wind and sun a spot receives:

> πανταχοῦ δὲ καὶ πάσης τῆς ὕλης πρὸς βορρᾶν τὰ ξύλα πυκνότερα καὶ οὐλότερα καὶ ἁπλῶς καλλίω· καὶ ὅλως δὲ πλείω ἐν τοῖς προσβορείοις φύεται. αὐξάνεται δὲ καὶ ἐπιδίδωσι τὰ πυκνὰ μὲν ὄντα μᾶλλον εἰς μῆκος, δι' ὃ καὶ ἄνοζα καὶ εὐθέα καὶ ὀρθοφυῆ γίνεται.... <τὰ δὲ μανὰ> μᾶλλον εἰς βάθος καὶ πάχος, δι' ὃ καὶ σκολιῶτερα καὶ ὀζωδέστερα καὶ τὸ ὅλον στερεώτερα καὶ πυκνότερα φύεται. σχεδὸν δὲ τὰς αὐτὰς ἔχει διαφορὰς τούτοις καὶ ἐν τοῖς παλισκίοις καὶ ἐν τοῖς εὐείλοις καὶ ἐν τοῖς ἀπνόοις καὶ εὐπνόοις· ὀζωδέστερα γὰρ καὶ βραχύτερα καὶ ἧττον εὐθέα τὰ ἐν τοῖς εὐείλοις ἢ τοῖς προσηνέμοις.
>
> In all places the wood of forests with a northern exposure is denser and more compact and better in general. And all in all more trees grow facing the north. Those that are close-packed grow and increase rather toward height, and therefore they become unbranched and straight and upright.... Those that grow far apart tend rather toward bulk and density, and therefore they become more bent and have more branches and are on the whole of heavier and denser wood. Trees have nearly the same differences as these when they grow in shady or sunny or windless or windy places, for trees in sunny positions or those facing the wind grow shorter and with more branches and less straight. (4.1.4-5)

The combination of these two factors I term the *natura loci*: the specific physical and environmental features of a location have an influence on how plants grow there, and because of this, some plants, in accordance with their own natures, prefer some locations over others. This section of book 4 sets the stage for what follows: a discussion both of specific geographical locations and of specific environments in which plants find themselves. The potential disparity between *geographical* and *ecological* environments is thus reduced to the bare *natura loci* and its influence on plants.

The geographical section of book 4 (4.2-4.5 for terrestrial regions and 4.6-4.9 for aquatic) is structured somewhat haphazardly.[76] Not all of the areas of the *oikoumenê* are included: most of the wider Greek world, including Ionia and Magna Graeca, is left out.[77]

[76] Unlike, for instance, in Strabo, where the discussion generally moves clockwise around the Mediterranean.

[77] A section on the plants of Lake Copais in Boeotia begins at 4.10.

Furthermore, the emphasis on each location surveyed is unequal: the section on Asia is dominated by the Far East to the detriment of Persia, and Egypt is certainly overrepresented, showing up both in its own section (4.2) as well as in the section on river plants (4.8). Additionally, aquatic plants take up a surprisingly large portion of the book (4.6-4.12), though the aquatic plants do provide Theophrastus with a segue from plants that are specific to a geographical location (e.g., the Nile or the Persian Gulf) to plants specific to an ecological niche (e.g., rivers or marshes in general). This transition from geographical variation to variation based on habitat is somewhat abrupt: "it is clear that plants particular to a location should be investigated individually, whereas those that are common should be investigated in common" (τὰ μὲν οὖν ἴδια θεωρητέον ἰδίως δῆλον ὅτι, τὰ δὲ κοινὰ κοινῶς; 4.10.1).

The loose connections continue on the way to the final section of the book. At the end of 4.12, Theophrastus states "Let the discussion concerning plants that live in water be closed" (καὶ περὶ μὲν ἐνύδρων ταῦτ' εἰρήσθω; 4.12.4). Following this, he immediately begins discussing the βραχυβιότης of various plants, concentrating initially on the differences between terrestrial and aquatic plants but proceeding to discuss the causes of long and short lifespan in plants in general. This leads to a lengthy section on plant diseases (4.14), which focuses mainly on familiar plants (olive, fig, and vine), and then to a final section (4.15-4.16) on the effects on plants of removing various parts (e.g., that topping a pine will kill it), again focusing on familiar species. Thus, by the end of book 4 Theophrastus is a long way off from where he began, both in terms of geography and in terms of subject matter.

If there is to be a unifying factor for book 4 of the *HP*, it must be found in the introductory section (4.1), which was discussed above. The connection between discussions of plants specific to various geographical regions and plants that inhabit specific ecological

niches is undoubtedly the *natura loci*. And this is Theophrastus' goal in writing the book. However, the looseness of the connections gives one pause. There is another influence here, which is possibly stronger than the desire to examine the *natura loci* of various spots: the influx of scientific knowledge that resulted from the campaigns of Alexander provided a strong impetus for Theophrastus to sort and categorize the new knowledge he has received and to integrate it with existing information. The new information was coming mostly from the east, but Theophrastus does not focus exclusively on eastern flora; he merely includes it as a major part of a survey of other regions of the inhabited world.

4.2.3 Egypt and India in *HP* 4

This integration of the unfamiliar with the familiar is not complete in book 4, however. Due both to the additional distance between India and Greece and to the precarious and short-lived hold Alexander's forces had over the Indus Valley, Indian plants necessarily remained less well known in the Greek world than their Egyptian counterparts. This fact is apparent both in the treatments these two regions receive in book 4 as well as in how individual Indian and Egyptian plants are referred to in other sections of Theophrastus' treatise. Areas that display this difference include: the names Theophrastus reports for various plants, how he uses these plants as examples throughout the *HP*, and the extent to which he engages in scientific speculation or scrutiny of the information he has received.

4.2.3.1 Plant names

The significance of names should not be dismissed lightly. Different kinds of names could be given, which would carry with them different meanings. First, a purely Greek name

could be applied to a foreign item. For instance, the Greeks applied the names of some of their gods to Egyptian counterparts, such as Zeus to the Egyptian god Ammon.[78] For plants in particular, Schiebinger discusses how the names European plant scientists assigned to new species they encountered in the Americas, names that often honored Europeans, were a way of asserting colonial authority over the natural world.[79] For medicinal plants in particular, a name can bring up connections with folk knowledge.[80] Thus the way the Greeks named and referred to foreign plants is significant for the way they conceived of them.

Egyptian plants frequently are referred to by name, whether a native Egyptian term or a Hellenized version.[81] Plants with Egyptian names in the *HP* include οὔϊγγον, περσέα, κουκιοφόρον, and σάρι. Of these, the name for the first, which refers to a plant cultivated for its edible root, is of unknown, though non-Greek, etymology.[82] The term περσέα refers to a plant which resembles a pear tree and whose fruit has a stone like a plum.[83] The next plant

[78] Smith 1926 172-175. Isis was the major exception to this trend. See also Thomas 2000 277-279, who notes that the names Herodotus gives for the gods are more than just appellations: they contain character and attributes.

[79] Schiebinger 2004 198.

[80] Lloyd 1983 133 discusses this for ἀριστολοχία as an herb for women in labor.

[81] Theophrastus does relate plants in Egypt to familiar counterparts either using the adjective αἰγύπτιος or by simply applying a Greek name to the foreign plant, but for the purposes of this section, I will focus on his use of Egyptian names. For this other sort of naming, see below.

[82] Taro (*Colocasia sp.*); it is twice referred to as τὸ ἐν Αἰγύπτῳ καλούμενον οὔϊγγον (*HP* 1.1.7 and 1.6.11).

[83] ἕτερον ἡ περσέα καλούμενον (*HP* 4.2.5); it is also referenced at *HP* 3.3.5 and *CP* 2.3.7. The identification with *Mimusops schimperi* "Egyptian avocado" is given by Hort 1916-1926, Index, and Amigues 1988-2006 *ad loc.* According to Amigues, περσέα is probably the name given by Greek traders to the tree that was called in Egyptian *chaouabou*. The name is possibly to due to the fruit's resemblance to the peach (περσική), though this fruit was not grown in the Greek world until much later (see chapter 5). See Amigues 1988-2006 *ad loc.* for her reasons for rejecting other possible identifications, including the peach (*Prunus persica*), the lasura (*Cordia myxa*), and the desert date (*Balanites aegyptiaca*). The *persea* is included in a remedy for ulceration of the uterus in the early Hippocratic text *On Diseases of Women* (1.90; VIII 216 Li.). Strabo mentions the *persea* along with the sycamore at 17.2.4 and in his discussion of the land of the Icthyophagi and Creophagi in Arabia: φύει δὲ καὶ περσέαν καὶ συκάμινον Αἰγύπτιον (16.4.14). Here, although it is said to grow outside of Egypt, it is paired with the sycamore, an explicitly Egyptian plant. Nicander mentions *persea* as a curative for white-lead poisoning at *Alexipharmica* 99, and gives an explanation of the plant's name: Perseus received it as a gift from Cepheus and planted it in Mycenae. Strömberg 1940 123 simply references its connection to the land of Persia.

name, κουκιοφόρον,[84] is a further Hellenized version of the plant's other name κόϊξ,[85] and refers to the doum palm, *Hyphaene thebaica.* The name has been traced back to the Egyptian *qwqw*, a name for a type of fruiting palm.[86] The name σάρι, which refers to a kind of edible reed that grows in water,[87] has an Egyptian etymology as well.[88] Some North African plants are sufficiently well known for their parts to have names: names for the leaf (μάσπετον) and fruit (φύλλον) of the silphium plant are given at *HP* 6.3.1.

The presence of so many names in Theophrastus' account of Egyptian plants could be due to his use of Hecataeus' *Aegyptiaca*, which described Hermes' application of names to the unnamed things in Egypt:

> ὑπὸ γὰρ τούτου πρῶτον μὲν τήν τε κοινὴν διάλεκτον διαρθρωθῆναι καὶ πολλὰ τῶν ἀνωνύμων τυχεῖν προσηγορίας, τήν τε εὕρεσιν τῶν γραμμάτων γενέσθαι καὶ τὰ περὶ τὰς τῶν θεῶν τιμὰς καὶ θυσίας διαταχθῆναι (Diodorus Siculus 1.16.1)
>
> First by him [*sc.* Hermes] a common way of speaking was articulated, many of the unnamed things obtained appellations, the discovery of writing occurred, and matters concerning sacrifice and honoring the gods were laid down.

Cole believes that Hermes' naming of ἀνώνυμα should be traced back to Democritus' theory of language.[89] The attention paid to the names of plants in Egypt would then be due to the same kind of developmental view of human culture that I discuss in chapter 2. Furthermore, the

---

[84] τὸ δὲ κουκιοφόρον καλούμενον (*HP* 4.2.7).

[85] It is referred to as the κόϊξ at *HP* 1.10.5 and 2.6.10. Also in the book 2 citation, the characteristics of the κόϊξ are given as part of a comprehensive description of different types of palm.

[86] The identification with Egyptian *qwqw* ("Art Früchte; unter anderen von den nüssen Dumpalme" in *WäS s.v. ḳwḳw*) was made by Hemmerdinger 1968 244.

[87] *HP* 4.8.2 and 4.8.5. Hort 1916-1926, Index, identifies the plant as *Cyperus auricomus,* while Amigues 1988-2006, in her index, identifies it as *Cyperus alopecuroides*. Both are sedges that have a wide growth range in the Mediterranean world.

[88] Amigues 1988-2006 *ad loc.*, citing Hemmerdinger 1968 245, notes that the name given by Theophrastus matches the Egyptian plant called *s3rj* ("eine offizinell verwendete Pflanze" in *WäS s.v. ś3rj*).

[89] Cole 1999 67-9 (with note 19); 108-9. Cf. also his discussions of Euhemerus and euhemerizing tropes in Diodorus and other authors, especially 48-9 and 153-63.

names for Egyptian plants are often Egyptian words themselves, which shows a kind of cultural borrowing at a familiar level, without colonial or imperialist tendencies. On the other hand, from these foreign names a connection to the exotic was preserved.

In contrast, Indian plants for the most part are either assimilated to certain familiar Greek plants, or left altogether unnamed.[90] Theophrastus' inability to give names for some plants is due to his source material, which likely did not include this information. For instance, after discussing the banyan, Theophrastus briefly mentions four Indian plants:

> ἔστι δὲ καὶ ἕτερον δένδρον καὶ τῷ μεγέθει μέγα καὶ ἡδύκαρπον θαυμαστῶς καὶ μεγαλόκαρπον· καὶ χρῶνται τροφῇ τῶν Ἰνδῶν οἱ σοφοὶ καὶ μὴ ἀμπεχόμενοι. ἕτερον δὲ οὗ τὸ φύλλον τὴν μὲν μορφὴν πρόμηκες τοῖς τῶν στρουθῶν πτεροῖς ὅμοιον, ἃ παρατίθενται παρὰ τὰ κράνη, μῆκος δὲ διπηχυαῖον. ἄλλο τέ ἐστιν οὗ ὁ καρπὸς μακρὸς καὶ οὐκ εὐθὺς ἀλλὰ σκολιός, ἐσθιόμενος δὲ γλυκύς· οὗτος ἐν τῇ κοιλίᾳ δηγμὸν ἐμποιεῖ καὶ δυσεντερίαν· διὸ καὶ Ἀλεξάνδρος ἀπεκήρυξε μὴ ἐσθίειν. ἔστι δὲ καὶ ἕτερον οὗ ὁ καρπὸς ὅμοιος τοῖς κρανέοις, καὶ ἕτερα δὲ πλείω καὶ διαφέροντα τῶν ἐν τοῖς Ἕλλησιν ἀλλ' ἀνώνυμα. (*HP* 4.4.5)
>
> There is also another tree, great in size and with amazingly sweet fruit that are also large. They are used as food by the sages among the Indians who also do not wear clothing. There is another whose leaf is elongated in shape like the feathers of the ostrich, which they put around their helmets; its length is two cubits. There is another whose fruit is long and not straight, but bent, and is sweet when eaten. This causes stomach cramps and dysentery, and for this reason Alexander forbade eating it. There is also another whose fruit is like the cornel-cherry. There are also many more that are different from those among the Greeks, but they are without names.

These are identified by Hort as jackfruit, banana, mango, and jujube.[91] Assimilation to Greek plants occurs as well, the major example being the banyan (Ἰνδικὴ συκῆ, *Ficus benghalensis*), which was named by the Greeks who saw the resemblance between its fruit and the figs they

[90] The major exception to this being ὄρυζα, rice, which is discussed below.

[91] Amigues 1988-2006 *ad loc*. disputes Hort's identification of the mango, instead preferring the fruit of *Cassia fistula*, or perhaps that of the tamarind (*Tamarindus indica*). A similar tree with similar fruit is mentioned by Aristobulus *BNJ* 139 F 37 (= Strabo 15.1.21). Its fruit is compared to that of the bean (κυάμος) and it causes death when eaten, though it is sweet like honey. Pearson 1960 174-5 suggests Aristobulus' and Theophrastus' fruit is the banana.

knew: δι' ὃ καὶ ἐκάλουν αὐτὸ οἱ Ἕλληνες συκῆν (*HP* 4.4.4). Other assimilations occur, including Indian barley: Ἰνδικὴ κριθή (8.4.2).[92]

An additional instance of Theophrastus' lack of names for Indian flora can be added from the case of the cotton plant.[93] A name for cotton—either for the plant or the fabric derived therefrom—is not attested at Theophrastus' date, or even by the time of Augustus.[94] Earlier reports typically conceptualize the cotton plant as a kind of tree-grown wool: ἔριον ἀπὸ ξύλου. Herodotus, who ascribes cotton to Egypt as well as to India, describes a breastplate that was given by King Amasis to Polycrates and subsequently stolen by the rebel Samians: κεκοσμημένον δὲ χρυσῷ καὶ εἰρίοισι ἀπὸ ξύλου (3.47). References to Indian cotton are also found at 3.106, when Herodotus is describing the marvels of India (τὰ δὲ δένδρεα τὰ ἄγρια αὐτόθι φέρει καρπὸν εἴρια καλλονῇ τε προφέροντα καὶ ἀρετῇ τῶν ἀπὸ τῶν ὀίων· καὶ ἐσθῆτι Ἰνδοὶ ἀπὸ τούτων τῶν δενδρέων χρέωνται), and at 7.65, when he is detailing the armaments of the various groups that compose Xerxes' army (Ἰνδοὶ δὲ εἵματα μὲν ἐνδεδυκότες ἀπὸ ξύλων πεποιημένα). In later times, cotton is still described as tree-wool. For instance, Megasthenes states that ἐνίοις [*sc.* κλάδοις] καὶ ἐπανθεῖν ἔριον (*BNJ* 715 F 8 = Strabo 15.1.20). Thus, when Theophrastus describes the cotton plantations of the island of Tylos, he adopts this preexisting terminology:

---

[92] I am aware of two similar cases for Egypt. First is the "Egyptian plum," simply called κοκκυμηλέα and mentioned at *HP* 4.2.10. This has been identified by Hort as sebesten (*Cordia myxa*), but by Amigues as *Balanites aegyptiaca*. Second is the "Egyptian mulberry" (sycamore; *Ficus sycomorus*), Αἰγυπτία συκάμινος, which is mentioned at *HP* 1.1.7, 1.13.2, 4.1.5, 4.2.1-4, and *CP* 2.9.8, as well as by Diodorus Siculus at 1.34.8, and therefore probably by Hecataeus of Abdera. Strabo (as stated above) mentions the sycamore in conjunction with the *persea* at 16.4.14 and 17.2.4.

[93] Theophrastus briefly mentions a plant from which the Indians make their clothes at *HP* 4.4.8, but gives his fullest description of the cotton plant when he discusses the island of Tylos (Bahrain), mentioning there that it is also found in India (4.7.8); cf. also his discussion of the island at *CP* 2.5.5ff. Nevertheless, it is valid to consider cotton "Indian," since many other authors, writing before and after the *HP*, refer to cotton as a peculiarity of India.

[94] See chapter 5.

> φέρειν δὲ τὴν νῆσον καὶ τὰ δένδρα τὰ ἐριοφόρα πολλά. ταῦτα δὲ φύλλον μὲν ἔχειν παρόμοιον τῇ ἀμπέλῳ πλὴν μικρόν, καρπὸν δὲ οὐδένα φέρειν· ἐν ᾧ δὲ τὸ ἔριον ἡλίκον μῆλον ἐαρινὸν συμμεμυκός· ὅταν δὲ ὡραῖον ᾖ, ἐκπετάνυσθαι καὶ ἐξείρειν τὸ ἔριον, ἐξ οὗ τὰς σινδόνας ὑφαίνουσι, τὰς μὲν εὐτελεῖς τὰς δὲ πολυτελεστάτας. (*HP* 4.7.7)
>
> This island (they say) also bears many of the wool-bearing trees. These have a leaf similar to the grapevine, but small, and they bear no fruit. The portion where the wool is contained is the same size as a spring apple. When it is ripe, it opens and ejects the wool, out of which they weave fine cloth, some of which is inexpensive and some very expensive.

This account does use the more "scientific" compound ἐριόφορος rather than ἔριον ἀπὸ ξύλου or the like, though it is unclear whether this is Theophrastus' own addition or if it was present in his source, Androsthenes' report (see below).

Rice (ὄρυζα) is the biggest exception to the nameless-Indian-plant rule, but it is a truly exceptional case. Unlike a banyan tree, which would certainly be too large to be transported to Greece, and unlike a jackfruit or banana, whose fruit would rot during the journey, rice, in the form of the dried grain, had already reached Greece before Theophrastus' time.[95] Therefore, when he writes of the plant, he is able to apply the name it already has received.[96] I will discuss Theophrastus' description of rice in more depth in chapter 5, but a key conclusion can be drawn from it. The "foreign" name ὄρυζα for rice is similar to names of the Egyptian plants I discussed above. But since rice as a commodity was known before Theophrastus' time, this does not lessen the essential unfamiliarity of the *plant* from which the grain comes. The plant itself is still a novelty to Theophrastus, even if it has an established name. So in book 8 of the *HP*, which is dedicated to cereal grains (σῖτος and τὰ σιτώδη), rice does not have a place,

[95] See chapter 5 for references and for a diachronic treatment of rice both before and after Theophrastus.

[96] The word ὄρυζα descends ultimately from an Old Iranian word which is also the source of Sanskrit *vrīhi* (Chantraine 1999 *s.v.*).

though Egyptian varieties of wheat are mentioned.[97] This clearly displays the greater establishment of the Egyptian varieties in Theophrastus' organizational system.

4.2.3.2 Plants as examples

A second way in which Egyptian plants and Egyptian varieties of common crops are treated differently from their Indian counterparts is how they are mentioned as *exempla* throughout Theophrastus' texts. By this I mean to answer two questions: in which books and sections are they are mentioned, and in the company of which other plants? Egyptian plants are often included in lists of examples throughout the *HP.* For instance, οὔϊγγον (taro) is mentioned in 1.1.7 and 1.6.11 as a plant cultivated for its edible root, and κουκιοφόρον (doum palm) is included at 2.6.10 in a survey of types of palms. Additionally, the fruiting habits of the περσέα are referred to at 3.3.5 and the early flowering and fragrance of various Egyptian flowers at 6.8.5. Furthermore, Egyptian wheat features in the discussion of cereal crops in book 8: its short germination time is mentioned at 8.1.5-6, it is named alongside other geographical variants at 8.4.3, and it is remarked that it can live on dew alone at 8.6.6. These references indicate Theophrastus' relative familiarity with the Egyptian plants.

In contrast to the relatively better known Egyptian varieties, Indian plants have a much smaller part to play in the *HP* and are mostly confined to book 4. An exception to this segregation of the Indian plants is the Ἰνδικὴ συκῆ (banyan), which is mentioned at *HP* 1.7.3 apropos of its method of propagation by adventitious roots (discussed below).[98] The banyan is

[97] Egyptian wheat is named in 8.4.3 along with Libyan, Pontic, Thracian, Assyrian, and Sicilian. See below for further discussion.

[98] For discussion of the banyan and the accuracy of Theophrastus' description of it, see Bretzl 1903 158ff. and Karttunen 1996 130-132 (with references).

included again among the Indian flora at 4.4.4. Other than this, the only major occurrences[99] of an Indian plant outside of book 4 is in book 9, when Theophrastus discusses the various spices, unguents, and incenses that come from the east,[100] and in book 3, when he classifies ebony and other eastern woods. But in these cases he is displaying familiarity with plant *products* rather than the plants themselves, and, as above in the case of rice, many of these aromatics and luxury woods were already known in the Mediterranean world before Alexander's conquests and Theophrastus' botanical research project.

4.2.3.3 Scientific questioning

A third feature that differentiates Theophrastus' account of Egyptian plants from his account of Indian ones is the presence or absence of any scholarly controversy over them. Theophrastus is often aware of scholarly debates that concern Egyptian plants. For example, in *HP* 6.3 he discusses the silphium plant in North Africa.[101] First he describes the plant and gives the names of its leaf (τὸ δὲ φύλλον, ὃ καλοῦσι μάσπετον) and fruit (σπέρμα δ' ἔχει πλατύ, οἷον φυλλῶδες, τὸ λεγόμενον φύλλον).[102] Then he notes that in two instances he has received contradictory information about the plant.[103] First, he sets out the information about which he is more confident. Silphium has a purgative effect on sheep (τὸ μάσπετον ... ὃ καθαίρει τὰ

[99] Indian barley is briefly mentioned at 8.4.2. This is discussed below.

[100] These special cases will be discussed in the next chapter.

[101] The silphium plant is a standard example for scientific inquiry concerning the *natura loci*, because it grows well only in North Africa. For the plant's place in Herodotus' ethnography of Libya and its relationship to the humors of Hippocratic medicine, see Thomas 2000 47-54.

[102] As discussed above. Pliny reports the same facts at *NH* 19.42: *huius [sc. laserpicii] folia maspetum vocabant, apio maxime similia. semen erat foliaceum, folium ipsum vere deciduum*. Amigues 2004 is a recent discussion of the attempts to identify this plant. She proposes it to be identified as a close relative of *Margotia gummifera* (217ff., with color plates).

[103] Lloyd 1983 122ff. sees Herodotean ἱστορίη in the way Theophrastus often reports various accounts of a plant, sometimes using distancing techniques such as φάσιν "they say" or *oratio obliqua*.

πρόβατα καὶ παχύνει σφόδρα; 6.3.1) and it avoids cultivated land (ἴδιον δὲ τὸ φεύγειν τὴν ἐργαζομένην; 6.3.3). Later, he reports a contradictory account in *oratio obliqua*: first, his source states that silphium must receive yearly trenching (καὶ τοῦτο ἴδιον καὶ διάφορον τοῖς πρότερον, ὅτι φασὶ δεῖν ὀρύττειν ἐπέτειον; 6.3.5), and second that the plant is not a purgative (ἐναντίον δὲ καὶ τὸ μὴ καθαίρεσθαι τὰ πρόβατα τὸ φύλλον ἐσθίοντα; 6.3.6). Theophrastus then notes ταῦτα μὲν ὁποτέρως ἔχει σκεπτέον. The conclusion is that further investigation is needed to decide which of the two accounts is correct, yet the very existence of two accounts indicates the greater knowledge that was available to Theophrastus about Egyptian plants.[104]

Another example of scientific scrutiny given to foreign plants comes when Theophrastus discusses the various distinct plants that are called λωτός, one of which grows in Egypt.[105] In book 4, he mentions two: first, the Libyan lotus-tree, *Zizyphus sp.*, noting various subvarieties that grow in Cyrene and the island of the Lotus-Eaters (4.3.1-3). Then he describes the Nile lotus, *Nymphaea sp.* (4.8.9-11) with no reference to the previous plant of the same name. Later, though, he notes the confusion that can come from this:

> τὰ μὲν ἐν πλείοσιν ἰδέαις ἐστὶ καὶ σχεδὸν οἷον ὁμωνύμοις, ὥσπερ ὁ λωτός· τούτου γὰρ εἴδη πολλὰ διαφέροντα καὶ φύλλοις καὶ καυλοῖς καὶ ἄνθεσι καὶ καρποῖς. (7.15.3)
>
> Some plants are found in many forms and are nearly of the same name, as is the case with *lôtos*. There are many forms of this plant that differ in leaves, stems, flowers and fruit.[106]

This kind of scrutiny and attention to detail is absent in his discussion of the Indian flora, for the simple reason that sufficient information about them had not yet reached Greece. A

[104] Vallance 1988 34 believes that Theophrastus favors neither account. True, he commits to neither; yet the manner of his presentation lends more credibility to the first.

[105] See Amigues *ad* 1.5.3 for the difficulty of determining which of the plants is being referred to when λωτός is cited as an example.

[106] Another example is discussed by Lloyd 1983 126-128, who convincingly shows that Theophrastus was generally more careful about distinguishing plants with similar names than Hippocratic doctors, through the example of Theophrastus' careful discussion of varieties of dittany at *HP* 9.161ff.

scholarly controversy was not possible without evidence. Despite this, at least in one case it seems Theophrastus is endeavoring to correct incorrect information about Indian flora. This concerns the banyan tree, as I will discuss in the following section.

4.3 Revisions and additions

Since the *HP* and *CP* took their current shape over decades, Indian plants were likely added to the text as new information became available. And although at the time of the final edition, Theophrastus was still more familiar with Egyptian plants than with Indian, he was certainly benefiting from the results of scientific inquiry taking place in the east. Thus, to a certain extent we can track knowledge about eastern flora as it arrived in Greece and was incorporated into the *HP*. The accounts we read in book 4 of the *HP* represent the latest stage in the development of Theophrastus' knowledge about Indian plants, whereas some references from other portions of the text reflect an earlier stage of his understanding.

But what were these sources? Theophrastus could have used Onesicritus' work, which was certainly full of botanical examples. Nearchus should have been available, and Aristobulus might have been. The sequence of these publications has been determined (with the requisite degree of hesitation that accompanies dealing with such fragmentary sources) to be the order in which I just listed them: Onesicritus certainly before 310;[107] Nearchus, who seems to react to Onesicritus and would thus have come out soon after;[108] and Aristobulus, who wrote in old age,

[107] Per Brown (1949 6-7) and Pédech (1984 76), Onesicritus' fourth (and last) book appeared around 305-4 BCE, based on the anecdote (*BNJ* 134 T 8 = Plutarch *Alexander* 46) that he gave a reading of his fourth book to King Lysimachus, who ascended to the throne in 304. This is the latest dating I have come across. Pearson 1960 84-54 dates the work as a whole to before 310, denying the significance of this anecdote.

[108] After 309, according to Pearson 1960 118; Pédech 1984 164 dates it surprisingly early (320-318), though he notes that it must come after Onesicritus.

in 295 at the earliest.[109] Theophrastus does not name any of these writers, however, which complicates matters. Fraser hypothesized that Theophrastus must have used a "dozen or more oral or written sources" on the flora of the east, but teasing apart the different strands is difficult.[110]

The standard example for comparing these sources is their discussion of the banyan.[111] Onesicritus describes a certain large tree whose branches form new roots:

> ὧν [*sc.* δένδρων] τοὺς κλάδους αὐξηθέντας ἐπὶ πήχεις καὶ δώδεκα, ἔπειτα τὴν λοιπὴν αὐξησιν καταφερῆ λαμβάνειν, ὡς ἂν κατακαμπτομένους, ἕως ἂν ἅψωνται τῆς γῆς· ἔπειτα κατὰ γῆς διαδοθέντας ῥιζοῦσθαι ὁμοίως ταῖς κατώρυξιν, εἶθ' ἀναδοθέντα<ς> στελεχοῦσθαι, ἐξ οὗ πάλιν ὁμοίως τῆι αὐξήσει κατακαμφθέντα<ς> ἄλλην κατώρυγα ποιεῖν, εἶτ' ἄλλην καὶ οὕτως ἐφεξῆς, ὥστ' ἀφ' ἑνὸς δένδρου σκιάδιον γίνεσθαι μακρόν, πολυστύλωι σκηνῆι ὅμοιον. (*BNJ* 134 F 22 = Strabo 15.1.21)
>
> Their branches grow to a length of 12 cubits and then take the rest of their growth downwards as if they are arching downward, until they make contact with the ground. Then they spread under the ground and take root like root-branches. Then they turn up and form a trunk, from which again in a similar manner they arch down with their new growth and form another root-branch, and then another successively in this way, until a great sun-shade is produced from one tree, similar to a tent with many poles.

In book 1 of the *HP*, Theophrastus gives a description that closely matches that of Onesicritus:

> ἰδία δὲ ῥίζης φύσις καὶ δύναμις ἡ τῆς Ἰνδικῆς συκῆς· ἀπὸ γὰρ τῶν βλαστῶν ἀφίησι, μέχρι οὗ ἂν συνάψῃ τῇ γῇ καὶ ῥιζωθῇ, καὶ γίνεται περὶ τὸ δένδρον κύκλῳ συνεχὲς τὸ τῶν ῥιζῶν οὐχ ἁπτόμενον τοῦ στελέχους ἀλλ' ἀφεστηκός. (*HP* 1.7.3)
>
> The nature and faculty of the roots of the Indian fig (banyan) are peculiar. It sends them out from the shoots until it makes contact with the ground and takes root, and around the tree the roots grow in a continuous circle, not in contact with the trunk, but at a distance.

In this passage, the additional "trunks" are derived from new growth from the shoots, much as in Onesicritus' account, though Theophrastus does not say that the new prop-roots put up

[109] Pearson 1960 152.

[110] Fraser 1994 172-179, 187-188.

[111] See Bretzl 1903 158ff., Brown 1949 81ff., and Fraser 1994 175 for discussions of the transmission of this information.

additional shoots. A mention of the banyan in the *CP* shows a similarly basic understanding of the tree:

> θαυμαστὴ γὰρ οὖσα τῷ μεγέθει μικρὸν ἔχει φύσει σφόδρα τὸν καρπὸν καὶ ὀλίγον, ὡς εἰς τὴν βλάστησιν ἐξαναλίσκουσα πᾶσαν τὴν τροφήν· καὶ γὰρ σφόδρα μεγαλόφυλλος· ἀφ' ὧν ἔοικεν διὰ τὴν εὐβοσίαν καὶ ἡ τῶν ῥιζῶν τῶν καθιεμένων εἶναι γένεσις. ἴσως δ' ἀνάπαλιν, ὅτι καὶ εἰς ταῦτα καταμερίζεται, διὰ τοῦτο οὖν ἀσθενέστερός ἐστιν καὶ ἐλάττων ὁ καρπός. ὑπὲρ δὲ τῶν ῥιζῶν ἐν ἑτέροις εἴρηται. (*CP* 2.10.2)
>
> It [*sc.* the banyan] is marvelous in size, but it has fruit that is naturally small and scanty, since it exhausts all its nourishment for sprouting. It has very large leaves indeed. Therefore, it is likely that the growth of the roots that are sent down also comes from its good feeding. But perhaps it is the other way around: there is weaker and smaller fruit because [the food] is divided up for the roots. The roots have been discussed elsewhere.

Here, Theophrastus is interested only in the relationship between the large size of the leaves and the small size of its fruit.[112] This information does not rely on a detailed account of the tree's growth, though Theophrastus mentions that he has discussed the roots elsewhere.

Yet in book 4 of the *Historia plantarum*, Theophrastus' description is fuller and more accurate:

> ἡ δὲ Ἰνδικὴ χώρα τήν τε καλουμένην ἔχει συκῆν, ἣ καθίησιν ἐκ τῶν κλάδων τὰς ῥίζας ἀν' ἕκαστον ἔτος, ὥσπερ εἴρηται πρότερον· ἀφίησι δὲ οὐκ ἐκ τῶν νέων ἀλλ' ἐκ τῶν ἔνων καὶ ἔτι παλαιοτέρων· αὗται δὲ συνάπτουσαι τῇ γῇ ποιοῦσιν ὥσπερ δρύφακτον κύκλῳ περὶ τὸ δένδρον.... εἰσὶ δὲ αἱ ῥίζαι φυόμεναι διάδηλοι πρὸς τοὺς βλαστούς· λευκότεραι γὰρ καὶ δασεῖαι καὶ σκολιαὶ καὶ ἄφυλλοι. (*HP* 4.4.4)
>
> The land of India has its own so-called fig tree, which sends down roots from its branches each year, as was said earlier. It sends these not from the new growth but from the year-old or still older. When these make contact with the earth, they make as it were a fence in a circle around the tree.... The roots as they grow are very distinct from shoots: they are whiter, hairy, crooked, and without leaves.

[112] The tree does in fact have small fruit, but it does not have large leaves. Modern scholars have suggested a confusion with the larger leaves of the banana (Bretzl 1903 171-172) or teak (Pearson 1960 101) somehow crept into Theophrastus' source. A similar, but more exaggerated error about the size of the leaves is found in Onesicritus' account: τὰ δὲ φύλλα ἀσπίδος οὐκ ἐλάττω (the leaves are no smaller than shields; *BNJ* 134 F 22 = Strabo 15.1.21). Theophrastus' "mistake" is understandable given the context of the quoted passage. He is attempting to show that plants that produce luxuriant vegetative growth have small fruits. The large size of the banyan tree and the small size of its fruit were well known. The largeness of the leaves is merely another detail that supports the theory that a large tree cannot produce large fruit.

Here, Theophrastus is presenting factually correct information that is not present in any other ancient account of the banyan. Despite the reference to his earlier account, he seems to be correcting it in detail by specifying that the adventitious roots do not come from the tips of the branches but from the old growth. Additionally, he provides a visual description of the growing roots to reinforce his claim.

This information certainly did not come from Onesicritus: did it come from Nearchus? That is the opinion of Bretzl, who believes (1903 181) that Nearchus wrote secret records for Alexander that were then made available only to scientific authorities. Pearson disagrees vehemently, stating that "such foolishness would surely be possible only in modern times."[113] Brown thinks this is far-fetched as well, but states that Theophrastus' source was the "royal archives."[114] Another possibility is the trierarch Androsthenes of Cos, who is the only member of Alexander's expedition that Theophrastus cites by name (at *CP* 2.5.5). He was one of the commanders on Nearchus' voyage from India,[115] and later was sent by Alexander on an additional expedition to explore the Arabian Sea.[116] His work was finished before Alexander's death in 323, because another expedition (led by Hiero of Soli) was sent and went further.[117] The five preserved fragments of Androsthenes all deal with the Arabian Sea, in particular with descriptions of the mangroves on the Indian coast and of the island of Bahrain (Tylos).[118] Then,

[113] Pearson 1960 101n69. Pearson further believes (1960 127) that Nearchus was not a more accurate observer of natural history than Onesicritus.

[114] Brown 1949 79.

[115] *BNJ* 711 T 1 (= Arrian, *Indica* 18.4).

[116] *BNJ* 711 T 2 (= Strabo 16.3.2) and 3 (= Arrian, *Anabasis* 7.20.7).

[117] *BNJ* 711 T 3.

[118] Bretzl 1903 23ff. thinks Nearchus is the source for the mangrove, despite Androsthenes' name being in the *CP*. Pearson 1960 142n104 states that Theophrastus' source is unknown, but could well be Androsthenes. Pearson believes that it is likely that no full botanical commentary of India was produced because of omissions, including

is it possible that Androsthenes, who shows a knack for botanical description, also wrote an account (official or otherwise) of the Indian flora? I would answer no, because the early date of Androsthenes' work, and Theophrastus' mention of him by name in the *CP* imply that Theophrastus knew of it early in his career. When the new information from another, unknown source came in, Theophrastus concentrated it in a revised version of book 4 of the *HP*, and did not have time to extend it to the *CP* before his death.[119]

An additional example of Theophrastus' developing knowledge of India is provided by Indian barley. At *HP* 8.4.2, he discusses the various ways different subvarieties of a crop can differ.[120] He states briefly that Indian barley, Ἰνδικὴ κριθή, is παραβλαστητική "having side-shoots" (Hort), "rameuse" (Amigues).[121] In book 8 Theophrastus references an earlier account (καθάπερ εἴπομεν), which can only have come from book 4. But when he describes this plant in the earlier book, he gives only a description of how it was used as food for the horses of Alexander's expedition:

> κριθαὶ δὲ καὶ πυροὶ καὶ ἄλλο τὸ γένος ἀγρίων κριθῶν, ἐξ ὧν καὶ ἄρτοι ἡδεῖς καὶ χόνδρος καλός. ταύτας οἱ ἵπποι ἐσθίοντες τὸ πρῶτον διεφθείροντο, κατὰ μικρὸν δὲ οὖν ἐθισθέντες ἐν ἀχύροις οὐδὲν ἔπασχον. (*HP* 4.4.9)
>
> [There is in India] also barley and wheat and another variety of wild barley, from which sweet bread and a fine porridge [are made]. At first when the horses ate this they perished, but little by little they became accustomed to it in its husks and did not suffer at all.

---

teak. In opposition to this stand the facts that Hort does in fact identify the wood from Tylos as teak (*HP* 5.4.7), which supports the idea of a botanical commentary by Androsthenes, and that a list of plants left out of the India section in book 4 of the *HP* would run to many thousands. This does not prove that no one reported on the plants there.

[119] This also would explain the relative paucity of references to Indian flora in the *CP*.

[120] In color, number of rows of seeds, size and spacing of seeds, as well as their δυνάμεις and πάθη.

[121] As this is not a feature of true barley, Theophrastus' Ἰνδικὴ κριθή has been identified as a kind of sorghum (Hort 1916-1926 and Amigues 1988-2006 *ad loc.*).

The book 4 account, then, contains anecdotal information and the book 8 scientific. Hort, rightly I think, believes a portion of the book 4 account (a description of the plant) has dropped out.[122] If this is the case, the anecdote about Alexander's army in book 4 is probably due to Theophrastus' use of an Alexander historian, possibly Ptolemy or Aristobulus. Both of these authors wrote later than Onesicritus and their accounts would therefore have come later to Theophrastus' attention. This example does not prove Theophrastus' sequence of composition, but simply emphasizes the uneven nature of the *HP* as we have it, from which we can see the evidence of revision.

4.4 Conclusion

Tracing Theophrastus' response to the influx of new information about exotic plants is daunting and can never reach sure conclusions. It is likely that the unevenness of the information about Indian flora in the *CP* and *HP* is due to his gradual incorporation of new information as it became available. India remained mostly out of reach for him. We have seen how Theophrastus incorporated the names for new plants, how he integrated these plants into existing categories and lists of examples, and how he began to ask scientific questions about them. These problems, which he often left unresolved in the hope of future research, could well have been influential in his decisions to devise a dual τέλος for plants. Furthermore, in the case of the banyan, we can see a remnant of his editing process in the differing accounts of the tree. These remnants of Theophrastus' process are also traces of the influx of the east into Greek consciousness, at least on a high intellectual level. Though we cannot be certain about

[122] Hort 1916-1926 *ad loc*. Amigues 1988-2006 *ad HP* 8.4.2 does not mention any possible missing text.

the exact sequence of Theophrastus' sources and revisions, we can get a good look at how this new side of the world was treated as the object of his scientific inquiry.

The preceding paragraph lists what is *likely* about Theophrastus' work. What is *certain* is that while he was becoming aware of this information and incorporating it into his writings, he was also developing a new theoretical framework to explain how all plants work, one that involved a significant break from Aristotle's teleology. Almost all of the extant work of Theophrastus concerns plants, but yet I do not think it due merely to the accidents of survival that this new plant teleology is so clearly expressed in these works. In chapter 2 I showed that Theophrastus had an ethnographic interest in plants as cultural (and cultivated) artifacts, and in the present chapter I have shown that he was also interested in them as scientific and philosophical objects. These two interests combine in his theory of a dual τέλος for plants: as cultivated plants that obey the culturally-imposed τέλος of producing fruit for humans and as free-living beings allowed to fulfill their own natures. In these two senses, the Theophrastean τέλη follow both νόμος/τέχνη and φύσις. Plants are seen in and of themselves and in relation to people. That is Theophrastus' true contribution to the science of plants.

5 Plants for the Medicine Box and Dining Table

So far in this dissertation, I've omitted what was probably the most basic and common relationship Greeks and Romans had with exotic plants: they bought plant products at the market and used them in culturally informed ways. In this chapter, I will explore this kind of interaction in more detail, particularly in the first century CE. Again I will return to India as a test case for these interactions with exotic plants for the reasons I have outlined before: it was never under the direct control of any western power and thus its status as "exotic" remained unchanged over long stretches of time. But though it was exotic, it was not unknown. I have chosen to focus on the first century CE because at this time merchant contact between the west and India was at its peak. The question I aim to answer is how the increased availability of India through its plant products contributed to the concept of India in the west. Despite the stagnation of ethnographic knowledge about India (as discussed in chapter 2), increased trade in the Hellenistic and early imperial periods increased *physical* knowledge of India's products. In this chapter, I trace how Indian plant products entered the consciousness of Greeks and Romans, as physical objects that could be bought, sold, prescribed, and eaten, and also as objects with metaphorical and scientific meaning. This kind of contact with India came about through products from the country itself, and is therefore of a different kind than what I have previously discussed. This was an India that could be held in the hand or ingested, and not merely history, geography, or myth. The physical presence of these objects caused Greeks and Romans to create and modify mental geographies and constructs to accommodate new data.

Indian plant products were not able to fulfill every function and suit every need. Here I juxtapose the two major ways these products entered the Mediterranean world: as luxury goods and as medicines. These two categories are not completely distinct, and I will explore

their overlap in the course of this chapter. Additionally, though I maintain my focus on "plants in text," I have somewhat broadened my scope to include evidence from archaeology and archaeobotany. Because in this chapter the focus is on plants and plant products as real, physical objects, this inclusion of material evidence seems appropriate. My study in this chapter is focused on two areas. First, I take a diachronic look at the entry of 1) rice, 2) plums, apricots, and peaches, and 3) pepper into the Mediterranean. From this study, a growing familiarity and knowledge about the uses of these plants is evident—in terms of medicine, luxury status, and agriculture—and analogy-based scientific thinking begins to fit these plants into familiar categories. Second, I take a more in-depth look at the first century CE to show how increased contact with the commercial products of India shaped people's conceptions of that exotic land. Through these two ways of looking, we can see the development of knowledge and opinion about exotic plants, and how these ideas played out in the practices of luxurious living and medicine.

5.1 Three exotic plants

We can see how new plants and products were integrated into existing systems of knowledge and belief by examining how they are talked about and classified across various time periods, both in technical literature and *belles lettres*. To this end, I will trace a select group of exotic plants (rice, plum/peach/apricot, and pepper) through writers of the Hellenistic period and the early principate, with some reference to material remains of these plants found by archaeologists. I have chosen these particular plants because they were known to some extent in the Classical Greek period (that is to say, before Theophrastus), and these plants continue to be known and used in scientific circles (unlike the banana and other

plants mentioned by Theophrastus). But their significance is broader than just scientific literature. These three plant groups have a wide presence in nearly all kinds of literature. In this section of the chapter, I am concerned primarily with surveying their entry into popular and scientific consciousness, and not the deeper significances of their use and how they were conceptualized by their users. Those topics, along with other Indian plants and plant products that arrived later in the Mediterranean (such as the eye medicine lycium), will be treated in section 5.2 below.

5.1.1 Rice

The first plant I will survey is rice. As mentioned in chapter 2, the Alexander historians and Theophrastus discuss rice as a feature of India's landscape and diet, and rice must have been commonly associated with the east in popular thought. But the grain was known before Alexander's time: Sophocles in his *Triptolemus* refers to rice-bread (ὀρίνδην ἄρτον; F 609 *TrGF* iv).[1] There is a reference to an unknown Indian grain in Herodotus:

> αὐτοῖσι ἐστὶ ὅσον κέγχρος τὸ μέγαθος ἐν κάλυκι, αὐτόματον ἐκ τῆς γῆς γινόμενον, τὸ συλλέγοντες αὐτῇ τῇ κάλυκι ἕψουσί τε καὶ σιτέονται. (3.100)
>
> They have [a grain] the size of millet in a sheath, which grows of its own accord from the earth. They gather it together with the sheath and boil it and eat it.

This could be a reference to rice, but as Karttunen points out,[2] there were many cereals growing in India and there is no assurance that Herodotus is describing rice.[3] After Alexander,

[1] It is not *absolutely* certain that this word refers to rice. Chantraine (1999 *s.v.*) says it "reste plausible" that the word is a doublet of ὄρυζα. It is clear though that ὀρίνδης refers to an exotic grain. A Hesychean gloss for this word is ὀρίνδα· ἄρτον παρὰ Αἰθίοψι, and Hehn 1902 497 suggests that this refers to Herodotus' Αἰθίοπες οἱ ἐκ τῆς Ἀσίης (mentioned at 3.94 as tributary to Darius and at 7.70 as fighting alongside the Indians).

[2] Karttunen 1989 52.

[3] Hehn 1902 496 calls the reports of rice before Alexander "unbestimmte Spuren."

the references to rice become more frequent. First, it is mentioned in the reports of Aristobulus and Megillus (*BNJ* 139 F 35 = Strabo 15.1.18):[4]

> τὴν δ' ὄρυζάν φησιν ὁ Ἀριστόβουλος ἑστάναι ἐν ὕδατι κλειστῷ, πρασιὰς δ' εἶναι τὰς ἐχούσας αὐτήν· ὕψος δὲ τοῦ φυτοῦ τετράπηχυ πολύσταχύ τε καὶ πολύκαρπον· θερίζεσθαι δὲ περὶ δύσιν πληιάδος καὶ πτίσσεσθαι ὡς τὰς ζειάς· φύεσθαι δὲ καὶ ἐν τῇ Βακτριανῇ καὶ Βαβυλωνίᾳ καὶ Σουσίδι· καὶ ἡ κάτω δὲ Συρία φύει. Μέγιλλος δὲ τὴν ὄρυζαν σπείρεσθαι μὲν πρὸ τῶν ὄμβρων φησίν, ἀρδείας δὲ καὶ φυτείας μὴ δεῖσθαι ἀπὸ τῶν κλειστῶν ποτιζομένην ὑδάτων.
>
> Aristobulus says that rice stands in enclosures of water, and it is included in beds. The plant's height is four cubits, and it has many ears and produces much fruit. It is reaped around the setting of the Pleiades, and it is winnowed like wheat. It also grows in Bactria and Babylonia and Susis; lower Syria also produces it. Megillus says that rice is sown before the monsoons but does not require irrigation or tending, as it receives water from the enclosures.

Theophrastus' description of the plant is part of his general survey of the plants of India in book 4:

> μάλιστα δὲ σπείρουσι τὸ καλούμενον ὄρυζον, ἐξ οὗ τὸ ἔψημα. τοῦτο δὲ ὅμοιον τῇ ζειᾷ καὶ περιπτισθὲν οἷον χόνδρος, εὔπεπτον δέ, τὴν ὄψιν πεφυκὸς ὅμοιον ταῖς αἴραις καὶ τὸν πολὺν χρόνον ἐν ὕδατι ἀποχεῖται δὲ οὐκ εἰς στάχυν ἀλλ' οἷον φόβην, ὥσπερ ὁ κέγχρος καὶ ὁ ἔλυμος. (*HP* 4.4.10)
>
> But most of all they sow so-called rice, from which they make mash. This is similar to rice-wheat, and when removed from the husk it is like gruel, which is easily digested. In appearance it is naturally similar to darnel, and it is in water most of the time, but it shoots up not into an ear, but into a sort of plume, like millet and Italian millet.

Despite this, we have seen in chapter 4 that rice is not fully integrated into Theophrastus' discussion of cereal grains (in *HP* book 8), but remains an outlier. This changes in the later period.

A jump ahead to the Augustan and early imperial periods shows that rice has grown in importance and availability and has been more integrated into systems of knowledge. Imports of rice into Egypt are attested by the presence of rice grains in the excavations of the Red Sea

[4] Additionally, Megasthenes *FrGH* 715 F 4 (= Diodorus Siculus 2.36.4) refers to rice, ὄρυζα, as one of the crops grown in India. For more discussion of the ancient sources, see Hehn 1902 495-504, Laufer 1919 372-373, and Karttunen 1997 142-145.

ports of Berenike and Myos Hormos,[5] and it is mentioned in the *Periplus of the Red Sea* as a trade item (§§14 and 31), though it is not included there among the major constituents of the Indo-Roman trade. Though material evidence fails us outside the dry and favorable conditions of the Egyptian desert, some rice clearly made its way to the population centers of the Mediterranean. Its most common use for Roman citizens and subjects was in medicine. Its particular medical benefit was taken to be its gentleness on the stomach, and even Horace refers to it at *Satires* 2.3.155 as a health food.[6] Celsus also discusses it at *De medicina* 2.20. He considers it *boni suci* (productive of good humors), along with wheat, barley, and wild game. In compilers, rice is categorized as a grain. Pliny the Elder makes mention of rice in his chapter on cereal grains, alongside Indian barley (see chapter 4), and gives a highly inadequate and erroneous description of the plant.[7] In Dioscorides as well rice is included among the other cereals (2.95),[8] and has thus attained a stable place in this aspect of Greco-Roman medical categorization. Lastly, rice shows up in the cookbook attributed to Apicius, where it is mentioned twice in quick succession (2.2.8 and 2.2.9) as a thickening agent for making sauces. In all of these Roman-era uses of rice, we see a naturalization of the eastern plant. In most, it is mentioned with no regard to its origin and carries with it fewer connotations of exoticism.

A last point about rice concerns its name. As I mentioned in chapter 4, the Greek ὄρυζα and the Latin *oryza* are descendents of an Old Persian word that is related to Sanskrit *vrīhi*. The

[5] Tomber 2008 72. It is suggested that the rice imports were primarily for Indian traders resident in these Egyptian ports, though this cannot be known for certain.

[6] It is part of the speech of the newly converted Stoic Damasippus: the rich man Opimius despairs that the rice that will improve his health costs eight *asses*.

[7] *NH* 18.71: *oryzae folia carnosa, porro similia, sed latiora, altitudo cubitalis, flos purpureus, radix gemmeae rotunditatis*. In fact, the leaves are not fleshy and broad, but thin and reed-like, and the root is not globular but fibrous.

[8] Dioscorides does not mention rice's provenance, only that it grows in wetlands (φυομένη ἐν ἑλώδεσι τόποις καὶ ἐνύγροις; 2.95).

name of the product was borrowed at the same time as the grain itself, probably because the Greeks that first came into contact with rice met it as a *grain*, not as a *plant*. The rice plant was never imported to the Mediterranean, so it was never included in the parlance of farmers or in agricultural manuals. The grain was thus abstracted from the plant in a way that some other eastern imports were not—peaches and apricots, for instance—and its borrowed and then naturalized name created for it a semantic space that was often free of connections with its ultimate eastern origin.

5.1.2 Plums, peaches, and apricots

Second, I will discuss a group of plants: the closely-related plum, peach, and apricot. Of these three, the plum was the earliest to arrive in the Mediterranean.[9] Athenaeus records the iambic poets Archilochus (fr. 241 West) and Hipponax (fr. 60 West) as having used the word κοκκύμηλον.[10] The name of the plum—κοκκυμηλέα is the tree, κοκκύμηλον the fruit—bespeaks its relative novelty, at least compared to the apple (μήλον) from which its name is derived.[11] But by the fourth century BCE, the plum was relatively common. Aristophanes' son the comic poet Araros is recorded as naming the fruit and the tree (fr. 20 *PCG* = 20 Kock) and his younger contemporary Alexis mentions a crown of plum wood (fr. 274 *PCG* = 272 Kock) and a basket of ripe plums (fr. 275 *PCG* = 273 Kock). Theophrastus refers to plum trees frequently in

[9] In the *Odyssey* it is not present in the garden of Alcinous or Laertes (see chapter 3).

[10] Ἀρχίλοχος is Bergk's emendation. The manuscripts of the *Deipnosophistae* read κοκκύμηλα οὖν ἐστι ταῦτα ὧν ἄλλος τε μέμνηται καὶ Ἱππῶναξ. Pollux 1.232 supports the emendation: χρῆται δὲ καὶ Ἀρχίλοχος τῷ τῶν κοκκυμήλων ὀνόματι.

[11] Strömberg views it as a folk etymology of an earlier *κοκκο-μῆλον, because the plum ripens at the same time cuckoos are calling (1940 73). This idea is supported by Chantraine (1999 *s.v.* κοκκύμηλον). A name such as *κοκκόμηλον, literally "seed-fruit," is likely to be a recent coinage and not an inherited name of great antiquity.

the *HP*, showing that they are relatively well integrated into his lists of examples.[12] For instance, plums are mentioned alongside cucumbers as having fruit made of flesh and fiber (ἐκ σαρκὸς μὲν καὶ ἰνὸς ὁ [*sc.* καρπὸς] τῶν κοκκυμήλων καὶ σικύων; *HP* 1.10.10), and they are included in a list of shallow-rooting trees, along with joint-fir and bullace (ἐπιπολαιτότατον δὲ θραύπαλος καὶ κοκκυμηλέα καὶ σποδιάς; *HP* 3.6.4).[13] About 150 years later, Nicander (*fl.* 130) refers to the plum in his *Alexipharmica,* using the strange name of ἀτάλυμνος (108). Elsewhere he etymologizes its usual name as meaning "cuckoo's apple": μῆλον ὃ κόκκυγος καλέουσι (Nicander fr. 87 Gow and Scholfield = Ath. 2.49, on δαμασκηνά, damsons).

In Latin, the form *prunum*, referring to the fruit,[14] occurs from the beginning of prose writing: in section 133 of Cato's *De agricultura*, as part of a list of trees that can be layered.[15] The plum is not mentioned by Varro, but is by many later authors, agricultural and otherwise, e.g., Virgil, Ovid, Columella, and Pliny. In these authors, plums are common, and plum trees are common to grow. Virgil mentions them both as recipients of grafting (*Georgics* 2.34) and as grafted onto other trees (*Georgics* 4.145). Columella mentions them growing wild (*RR* 2.2.20 and 3.9.5) and providing good fodder for pigs (7.9.6), and gives instructions on how to preserve the fruit (12.10.2-3). They are therefore very common by the middle of the first century CE.

---

[12] For the occurrences of the plum in the *HP*, see Hort 1916-1926 Index of Plants *s.v.* κοκκυμηλέα or Amigues 1988-2006 vol. 5, index des noms de plantes *s.v.* κοκκυμηλέα. Plums are mentioned only twice in the *CP*: its long roots make it hard to kill, similarly to the pear (1.3.3); and its fruit is classified alongside grapes, apples, pears, and olives (4.1.2)

[13] This list is attributed to the Arcadians. At *HP* 3.6.5, Theophrastus gives the opinion of οἱ ἐκ τῆς Ἰδῆς, and they report that the plum is deep-rooting and thus hard to kill (δυσώλεθρον δὲ τὴν κοκκυμηλέαν); cf. the previous note.

[14] *Prunum* is the fruit; *prunus* is the tree, at least in classical authors. This form may have the same origin as the Greek προύμνη, mentioned by Theophrastus at *HP* 9.1.2. Hort (Index of Plants, *s.v.*) equates the προύμνη to the σποδιάς, and translates both "bullace." Amigues 1988-2006 translates "prunier" and notes (xxxv n73) that this term was possibly borrowed in Asia Minor during Theophrastus' lifetime.

[15] Despite this, Pliny insists that plums were not introduced until after Cato's time: *pruna quoque omnia post Catonem coepisse manifestum erit* (*NH* 15.46).

In the Roman world, the peach and apricot appear to enter together and are often thought of as a pair. Plums are not added to this group for another half-century. The first recorded appearances of these fruits in texts are in the first century CE.[16] Numerous peach pits found preserved in a storage jar (*dolium*) among other vegetable remains at the Villa Vesuvio at Scafati (near Pompeii) provide evidence that peaches were grown near Mt. Vesuvius at the time of the eruption in 79,[17] and it seems that there is also evidence from at least a century earlier from the find of charred peach pits in the main drain of the House of Vestals in Pompeii.[18] Neither peaches nor apricots are mentioned by Cato, Varro, or Virgil, but Columella (writing around 70 CE) gives directions on how to plant both and comments on their pleasantness (5.10.19-20): *sorbi quoque et Armeniaci atque Persici non minima est gratia*. Celsus in his *De medicina* mentions oil from peach kernels at 6.7 (as an ingredient for a medicine to be applied to the inner ear), and Scribonius mentions peach kernels as being beneficial when ground up in wine and drunk (*prosunt et nucleorum persicorum interiora ex vino trita atque pota quam plurima*; 184). Indeed, Ciaraldi suggests that the peach pits found at the Villa Vesuvio were part of a working pharmacy, as remains of other medicinal plants and herbs were found in the same context.[19]

---

[16] The peach and apricot originated in China and spread westward from there, reaching Iran in the first or second century BCE, and then Rome in the first century CE. Cf. Laufer 1919 539: "Neither tree is mentioned by Theophrastus, which is to say that they were not noted in Asia by the staff of Alexander's expedition." The reasoning here is specious—many other Asian species are not included in Theophrastus—but the conclusion is sound, based on the lack of other textual evidence for these species. Other negative evidence is provided by lists of plants found in Assyrian gardens: plums are mentioned, but apricots and peaches are not (Margueron 1992 60). Athenaeus 82e-f claims Theophrastus wrote about peaches, citing *HP* book 2, though there is no reference to a περσικόν in that book. Theophrastus does elsewhere discuss the "Persian nut," the walnut at *HP* 3.6.2-3 and 3.14.4, calling it ἡ περσικὴ καρύα both times. This is likely the source of Athenaeus' confusion. See Sharples 1995 145-146.

[17] Ciaraldi 2005 179-8; Ciaraldi 2007 61-74.

[18] Ciaraldi 2007 145-146.

[19] Ciaraldi 2007 61-74.

Yet the close resemblance a modern grocery-shopper perceives to exist between plums, peaches, and apricots was not always noted in the ancient sources. In Columella, the apricot and peach are taken together, but the plum is separate from these two. In Dioscorides, plums and peaches/apricots are in the same general grouping of plants, but they are not presented in close sequence. In the *Materia medica*, these plants are mentioned as follows: the plum tree at 1.121 (called a δένδρον γνώριμον), peaches at 1.115.4 (called τὰ Περσικὰ μῆλα), and apricots at 1.115.5 (called τὰ Ἀρμενιακὰ μῆλα).[20] They are also integrated with other tree fruits (apple, cherry, pear, citron, etc.). The appearance of these three plants together in a medical context is new, since they are lacking from the Hippocratic Corpus.[21] Many of the plants included in this section of Dioscorides are recognized as phylogenetically related by modern botanists, and it seems that Dioscorides has developed a similar system, though he does separate the plum from the peach and apricot among the Rosaceae.[22] The overall sequence he presents at 1.113ff. (non-Rosaceae in parentheses) is: cherry, (carob), apple, quince, rose-apple, crab apple, peach, apricot, pear, (nettle), medlar, (cornelian cherry), sorb, plum, (strawberry tree), almond.

It is likely that the time gap between the arrivals of these three fruits in the Mediterranean is responsible for this lack of integration. The plum arrived first and received a name (*prunus* or κοκκύμηλον) that did not contain any geographical information. The apricot

[20] It is also worth noting that the Greek names for the peach and apricot are certain markers of their novelty. The technique for naming them is traditional, however. The use of an adjective of place plus μήλον to describe a foreign fruit is very old, since Κυδώνια μῆλα was used to refer to quinces from the time of Stesichorus. See Strömberg 1940 121-127. Compare also the Latin name of the pomegranate (*Punica mala*; only later was it called *granata*).

[21] At least *pêche*, *abricot*, and *prune* are not included in Littré's index.

[22] Dioscorides does not explain his system of organizing the elements of his *pharmacopeia*, though, as here, it is far from a haphazard listing. He does criticize the organization of earlier authorities (ἥμαρτον δὲ καὶ περὶ τὴν τάξιν; praef.3) and states that his organization will be different and that he will organize things according to their capacities (πειρασόμεθα καὶ τῇ τάξει διαφόρῳ χρήσασθαι καὶ τὰ γένη κατὰ τὰς δυνάμεις ἑκάστου αὐτῶν ἀναγράψασθαι; praef.5). See Strömberg 1940 18-20, Beck 2005 xvi-xviii, and also below concerning pepper.

and peach, on the other hand, arrived nearly simultaneously, and received names that bespoke their foreign origin. This distinction kept these plants separate in conception until sufficient time had passed for the observation of their similarities to supersede these differences. Pliny the Elder is the first author to group these three plants. He discusses peaches and their varieties at *NH* 15.39-40 and 15.44-46,[23] and apricots (which he considers a subtype of exotic plum) at 15.41.[24] In the *NH*, then, these three plants display a close connection with each other that arose despite their different times of arrival into the Mediterranean world.

5.1.3 Pepper

The final plant I will discuss in this way is pepper. There is by far the most information about this plant, both from written and material sources. Furthermore, it is known from a relatively early period, and its import was a driving force behind the growing trade between India and the Roman Empire, as I discuss below. An important distinction between the ancient portrayals of pepper and of the previous two plants is pepper's connotations of luxury in addition to its use as a medicine. This led to pepper's being referenced by writers from a wide range of genres, and thus we can get a wide-angle view of its integration into the Mediterranean world. Here I will briefly mention archaeobotanical and textual evidence for the importation and use of pepper before looking at how it is integrated as a medical and scientific plant and then turning to its use as a food and luxury good.

The largest single find of ancient pepper comes from Berenike, on the Red Sea coast of Egypt. There, an Indian-made storage jar was found in the courtyard of a first-century CE

[23] In the latter passage he carefully distinguishes between the *persica* and the *persea*, the Egyptian fruit I discussed in chapter 4.

[24] In Pliny's words, *nec non ab externa gente Armeniaca*.

house north of the temple of Serapis, containing 7.5 kg of pepper. In the same context, about 3,000 individual peppercorns were found.[25] Pepper has also been found, usually as charred peppercorns, in less favorable conditions. Ciaraldi reports that black pepper is found in Pompeii starting in Phase II (fourth-mid second century BCE), accompanying chickpeas and lentils, which are likely imports from North Africa.[26] This early find comes from the House of Hercules' Wedding, indicating a high-status diet of the inhabitants.[27] Later finds from Phase III (mid-second century BCE-79 CE) contexts in Pompeii include mineralized peppercorns from the cesspit and the main drain of the House of Vestals.[28] Textual evidence of the pepper trade is also abundant and often moralizing (see below), though a straightforward account of the trade in pepper is available from the first-century CE *Periplus of the Red Sea*, which mentions both long pepper from northern India (Barygaza) in §49 and black pepper from the Malabar Coast of southern India (modern Kerala) in §56.

The pepper that was imported along this trade route would have been put to use as a medicine as well as a spice. Pepper is called for in several of the medical texts that make up the Hippocratic corpus, presupposing its availability in classical Greece. It is listed as an ingredient for a pneumonia remedy: περιπλευμονίης ἐκλεικτὸν ... ἀβρότονον ἐν ὀξυμέλιτι, πέπερι (*Appendix to Regimen in Acute Diseases* §11; II.466 Li.).[29] It is also (quite sensibly) employed as an errhine, though it is used especially for pain in the teeth:

[25] Tomber 2008 55; 76.

[26] Ciaraldi 2005 196-197.

[27] Ciaraldi 2007 99ff., esp. 114-115.

[28] Ciaraldi 2007 118ff., esp. 139 and 145-146.

[29] The text is a bit shaky at this point. The reading πέπερι is not in doubt, but is not clear what punctuation to apply (see Littré's note *ad loc*.). A possible alternative reading is to take πέπερι with what follows in a recipe including black hellebore.

> τὰ ἐντεθέντα ἐς τὴν ῥῖνα, ἢν πυρετήνωσιν· ἢν μὲν λυθῇ ἡ ὀδύνη, παχέα κατὰ τὸν μυκτῆρα ῥεῖ· ἢν δὲ μήτε ὀδύνη, μήτε πυρετός, λεπτὰ καὶ ἴσως πυρώδεα, οἷον τὸ μὲν λεπτὸν Ἡγησίππῳ ἐς νύκτα προσθεμένῳ, τὸ δὲ παχὺ τῷ ἐν Κορίνθῳ εὐνούχῳ· εἰ δεῖ, τὸ σκαλεύειν· πέπερι. (*Epidemics* 4.40; V.182 Li.)
>
> [Medicines] put into the nose if the patient suffers from fever: if the pain is relieved, thick [matter] flows from the nostrils. If neither the pain nor the fever [is relieved], thin and possibly inflamed [matter flows]. For Hegisippus, who was treated at night, thin; but for the eunuch in Corinth, thick. If necessary, use scraping and pepper.[30]

In *On Diseases* 3, pepper is mentioned as a part of a treatment for tetanus (§12; VII.132 Li.) and for pleuritis (§16; VII.150 Li.) A striking use of pepper is found in the Hippocratic *Diseases of Women* 1, where pepper is used in making pessaries (though it is referred to as an eye medicine). Here we see pepper being called the ᾽Ινδικὸν φάρμακον:

> κόκκους ἐκλέψαντα ὅσον τρεῖς ᾽Ινδικοῦ φαρμάκου, τοῦ τῶν ὀφθαλμῶν, ὃ καλέεται πέπερι, καὶ τοῦ στρογγύλου, τρία ταῦτα λεῖα τρίβειν, καὶ οἴνῳ παλαιῷ χλιηρῷ διεὶς, βαλάνιον περὶ πτερὸν ὄρνιθος τιθέναι, καὶ ὧδε προσάγειν. (§81; Li. VIII.202)
>
> Remove the husk from three peppercorns of the Indian drug, the one used for the eyes, which is called pepper, and [which should be] of the round type, grind three of these until smooth, and moisten with warm aged wine, put it around a bird's feather as a pessary, and apply in this way.[31]

In a way the presence of pepper here is unsurprising, since gynecological treatises in the Hippocratic Corpus generally include more exotic plants and remedies.[32] This is only a partial listing of the occurrence of pepper in this and other texts in the corpus. This shows that

[30] Presumably the teeth are scraped and pepper is inserted into the nose. Cf. *Epidmics* 6.6.13 (V.328 Li.), where Hegesippus is mentioned again apropos of "those for whom a thin discharge from the area of the eyebrow supervenes upon pain of the teeth." At *Epidemics* 7.64 (V.428 Li.), a woman with tooth pain rinses her mouth with castor oil and pepper.

[31] With this passage, cf. the fuller (though even more corrupt) account given in *On the Nature of Women* §32 (VII.364 Li.), which has informed my translation. In this passage, pepper is called the "Median drug" (Μηδικοῦ φαρμάκου) and 30 grains are called for. Hanson 1975 569 believes that *Nat. Fem.* is a later excerpting of *On the Diseases of Women*.

[32] Lloyd 1983 81-82; Byl 1995 230-231. For instance, 56 of 78 total occurrences of "Egypt" or "Egyptian" occur in gynecological treatises and 35 of 38 for "Ethiopia" and "Ethiopian." See also Thomas 2000 73.

pepper was an at least somewhat familiar ingredient in the pharmacopeia,[33] but at the same time, its foreignness was noted. The appellation "Indian remedy" calls attention to its exotic origin and all the connotations that come with the idea of India (see below).

Considering the amount of use pepper receives in early texts of the Hippocratic Corpus, it is not surprising that it continues to be mentioned by scientific writers.[34] Theophrastus includes it in his survey of useful plant products in book 9 of the *HP* (9.20.2). He does not mention its provenance, but does describe it as being of two kinds, round (στρογγύλον, cf. the passage from *Diseases of Women* 1 above) and elongated (πρόμηκες). He says that long pepper is stronger (ἰσχυρότερον), but both kinds are heating (θερμαντικά) and they can provide a remedy for hemlock poisoning (πρὸς τὸ κώνειον βοηθεῖ ταῦτα). Theophrastus' reference to two kinds of pepper plants, though scientifically accurate, is not maintained in later sources, which conflate long pepper (*Piper longum*), black pepper (*Piper nigrum*), and white pepper (the seed of *Piper nigrum* without the outer black integument) as being different developmental stages of the fruit of a single plant (see Pliny's and Dioscorides' descriptions below). Nicander doesn't distinguish subtypes of pepper when he lists its uses in his two extant poems. At *Theriaca* 876, pepper is a generic remedy for various poisons, and in the *Alexipharmica* it is listed as a remedy for hemlock (201, alongside silphium; cf. Theophrastus above), bull's blood (332; silphium is here too), and litharge (607) poisons.

On the Latin side, pepper is common in Celsus' *De medicina*: it is classified as "heating" (*calefaciunt piper*; 2.27) and it is listed among medicines for causing sneezing:

[33] See Littré's index in volume X, *s.v.* poivre for more occurrences in *On Diseases of Women* and in other texts.

[34] The Hippocratic *On Diseases of Women* 1 is likely one of the earlier Hippocratic texts, containing material dating to the fifth century. See Jouanna 1999 385-386.

> Hos aegros quidam subinde excitare nituntur admotis iis, per quae sternutamenta evocentur, et iis, quae odore foedo movent, qualis est pix cruda, lana sucida, piper, etc. (3.20)
>
> Certain physicians strive to rouse these patients by applying substances through which sneezing may be caused and those which stimulate by a foul odor, for example raw pitch, unclean wool, pepper, etc.

Pepper is a common ingredient for Celsus, and it is used in all kinds of medicaments.[35] Celsus occasionally specifies long pepper or white pepper or round pepper, the three types distinguished by Dioscorides (see below). Pliny gives a detailed description of what he believes to be the cause of the three varieties of pepper:

> semina a iunipiro distant parvulis siliquis, quales in phasiolis videmus. hae prius quam dehiscant decerptae tostaeque sole faciunt quod vocatur piper longum, paulatim vero dehiscentes maturitate ostendunt candidum piper, quod deinde tostum solibus colore rugisque mutatur. (*NH* 12.26)
>
> The seeds are different from the juniper because of their little pods, which are like those we see in kidney beans. When these are picked before they open and are dried in the sun, they make what is called long pepper. But if they open gradually, at maturity they give us white pepper, which in turn changes color and wrinkles when it is dried in the sun [producing black pepper].

Notable here is Pliny's attempt to explain the three varieties of pepper by analogy to the well-known growth process of legumes. Pliny also states that a kind of pepper grows in Italy (see chapter 3 and below), and mentions pepper frequently in his books on medicine (*NH* 23-32).

Dioscorides weaves together many of the strands of information about pepper in his *Materia medica*. He discusses the spice at 2.159: it is said to grow in India, and to be of three types, which differ in their maturity:

> πέπερι δένδρον ἱστορεῖται φυόμενον ἐν Ἰνδίᾳ, καρπὸν δὲ ἀνίησι κατ' ἀρχὰς μὲν προμήκη καθάπερ λόβους, ὅπερ ἐστὶ <τὸ> μακρὸν πέπερι, ἔχον ἐντὸς κέγχρῳ παραπλήσιον, τὸ μέλλον ἔσεσθαι τέλειον πέπερι, ὅπερ κατὰ τοὺς οἰκείους ἀναπλούμενον χρόνους βότρυας ἀνίησι, κόκκους φέροντας οἷον ἐρρυσωμένους, τοὺς δὲ καὶ ὀμφακώδεις, οἵτινές εἰσι τὸ λευκὸν πέπερι. (2.159.1)

[35] Pepper also occurs 46 times in 271 prescriptions listed in the *Compositiones* of Scribonius.

> Pepper is said to be a tree that grows in India. It produces a fruit at first elongated like bean pods, which is the long pepper. This has inside it something very similar to millet seeds, which will become the mature pepper. When this opens at the proper times, it produces clusters that bear the peppercorns that are as it were wrinkled. Some are like unripe grapes: these are the white pepper.

Dioscorides lists several medical uses of pepper, though he does not mention it as a hemlock remedy. He ends his discussion by emphatically denying that the root of the pepper plant is ginger.[36] The most interesting feature of Dioscorides' account comes from its context, however. He includes the pepper plant among other highly odorous plants from the Mediterranean and beyond: Arabian mustard (2.157); hedge mustard, a Mediterranean native (2.158); ginger (which he believes is from Arabia; 2.160); smartweed (2.161) and sneezewort (2.162), two more native Mediterranean species.[37] We can see here a true integration of pepper into the professional's pharmacopeia. Plants from various origins have been brought together through a shared feature, and plants from abroad are given no special treatment *vis-à-vis* European plants.

When we look at sources that do not treat pepper as a medicine, we can see a different trajectory for the rise of pepper. A first difference is its lack of visibility in the Greek world. Theophrastus knows only its medical uses, and its consumption for other reasons is unknown in the classical or Hellenistic Greek contexts.[38] Starting in the Augustan period, pepper became more and more available in the upper-class Roman context, and it was more and more used in

[36] Pliny states the same at *NH* 12.28: *non est huius arboris radix, ut aliqui existimavere, quod vocant zingiberi*.

[37] Here Dioscorides' τάξις διάφορος must be based on the δύναμις of odor or pungency.

[38] The only non-medical references I am aware of from Classical Greek are in Aristotle' *Poetics* 1458a15, where he comments on the odd form of the word πέπερι and in fragments of middle comedy preserved in Athenaeus 2.66d-e: Antiphanes frr. 274 and 275 *PCG* = 277 and 279 Kock, Eubulus fr. 125 *PCG* = 128 Kock, and Ophelion fr. 3 *PCG* = 3 Kock). These scattered references do not add up to a highly textually visible use of pepper outside of medical situations. Even in situations where the opulence and richness of the east are celebrated, such as Ptolemy II's procession (Callixinus *FGrH* 627 F 2 = Athenaeus 5.196A-203B), pepper is not mentioned, though cinnamon, nard, and other spices are present in abundance.

texts as a stereotyped marker of luxury—whether as a seasoning for food or as an aromatic. This difference between the visibility of pepper in Greek and Latin texts is at least partially due to Roman moralism, as will become clear below.

Horace is the earliest extant poet to make extensive use of pepper. In two *Satires*, he mentions white pepper as part of the food laid for an extravagant feast (*invenior piper album cum sale nigro / incretum puris circumposuisse catillis*; 2.4.74-75) and as an ingredient in one of Nasidienus' sauces (2.8.45-50). In his *Epistles*, Horace records that pepper and spices were sold wrapped in scraps of papyrus (*tus et odores / et piper et quidquid chartis amicitur ineptis*; 2.1.269-270)[39] and he uses it as in hyperbole when describing his *vilicus'* loathing of his farm (*angulus iste feret piper et tus ocius uva*; 1.14.23). Pepper is paired with frankincense in both of these instances, a clear affirmation of its luxury status. A generation later, Ovid includes pepper in the particularly exotic context of aphrodisiacs in his *Ars amatoria:*

> sunt qui praecipiant herbas, satureia, nocentes
> sumere; iudiciis ista uenena meis.
> aut piper urticae mordacis semine miscent
> tritaque in annoso flaua pyrethra mero;
> sed dea non patitur sic ad sua gaudia cogi,
> colle sub umbroso quam tenet altus Eryx. (*AA* 2.415-420)
>
> Some would advise that you take that harmful herb savory: this is poison, in my opinion. They mix pepper with the seed of the stinging nettle and yellow lichwort ground up in aged wine. But the goddess who dwells on lofty Eryx below the shaded hill does not allow one to be forced to her pleasures in this way.

In his characteristically impish way, Ovid takes the word "*sic*" very literally and goes on to recommend some safe, local aphrodisiacs: white onions, arugula, eggs, Hymettan honey, and pine nuts (421-424). But we should note that here pepper is not in the company of frankincense, but is grouped with native Mediterranean herbs. Pepper here is paired with

[39] Cf. Martial 3.2.2-5 (addressing his *libellus*): *festina tibi vindicem parare / ne ... turis piperisve sis cucullus*, discussed below.

herbs that are exotic because of their use, but are not *geographically* exotic. In all of these early uses, we see pepper used as a foodstuff, a seasoning, and an exotic, hard-to-come-by luxury good, but not as a medicine. In the following section I will explore the relationship between the medical and the consumer aspects of pepper, but here it is enough to conclude that pepper had a somewhat sudden arrival in Latin texts, and often came bearing mental connections with other eastern luxuries.

After Ovid, these connections with luxury become more pronounced. Over the course of the first century, Roman authors draw upon pepper for characterizing and satirizing the over-the-top behavior of wealthy Romans. Pepper is sprinkled liberally throughout the satires of Persius and Juvenal, as well as in the poetry of Martial. And when Pliny is not describing pepper as a scientific specimen, he is railing against its use on the grounds that it is an expensive, needless, corrupting luxury. After noting the price of each of the three varieties of pepper (discussed below), Pliny decries this useless expenditure:

> usum eius adeo placuisse mirum est; in aliis quippe suavitas cepit, in aliis species invitavit: huic nec pomi nec bacae commendatio est aliqua. sola placere amaritudine, et hanc in Indos peti! quis ille primus experiri cibis voluit aut cui in appetenda aviditate esurire non fuit satis? utrumque silvestre gentibus suis est et tamen pondere emitur ut aurum vel argentum. (*NH* 12.29)
>
> It is surprising that its [*sc.* pepper's] use has been so pleasing. In some things, their sweetness draws us in; in others their appearance invites us. In the case of pepper, there is nothing to recommend either the fruit or the berry. It pleases by pungency alone, and it is sought out among the Indians. Who was it, who first wanted to experiment on it as food or whose greedy appetite required more than hunger? Both [*sc.* pepper and ginger] grow wild for their native peoples, yet they are bought by weight like gold or silver.

Pliny's comments here are useful since they represent the beliefs of a Roman traditionalist, and they are not couched in satire. His is a gut reaction against the exotic spice. Pliny's

solution to the problem posed by pepper is to use the native Italian "pepper," which I mentioned briefly in chapter 3:

> piperis arborem iam et Italia habet, maiorem myrto nec absimilem. amaritudo grano eadem quae piperi musteo credatur esse: deest tosta illa maturitas ideoque et rugarum colorisque similitudo. (*NH* 12.29)
>
> Now even Italy has a pepper tree, which is bigger than a myrtle and not dissimilar. Its seeds have the same sort of pungency which we think fresh pepper has. But it does not have that ripeness that comes from drying out, and similarly does not have a visual similarity in its wrinkles and color.[40]

Pepper is a corrupting imported good (and should be shunned), but at the same time it is worthwhile to find a native equivalent for it. What we can see is that pepper as an aromatic and a spice was occupying a prestige space in the upper-class Roman mindset, though attitudes to it were not uniform and a single person, such as Pliny, could have different reactions to it in different circumstances. The dissonance between various Roman views of pepper is discussed further below.

Lastly, I should mention the Latin and Greek names for pepper and how these may have affected the spice's integration and acceptance. *Piper* and πέπερι can be traced to Middle Indic words that are related to Sanskrit *pippalī* (an interchange between *r* and *l* is a common feature of Middle Indic dialects).[41] Thus, the name is at first glance a similar case to that of rice, discussed above. A foreign borrowing is used for a plant *product*, the living plant version of which was not the object of attention. Yet, unlike rice, pepper never lost its foreign stigma. Perhaps this was due to its uniqueness as a pungent spice that had no local equivalent, perhaps to pepper's early status as the "Indian remedy," a name more reminiscent of the names for

[40] Pliny mentions Italian pepper also at *NH* 16.136: *vivit in Italia piperis arbor*.

[41] The Sanskrit *pippalī* refers specifically to long pepper (*Piper longum*) and also sometimes to the bodhi tree (peepal); the Sanskrit word for black pepper is *marīca*. Chantraine 1999 *s.v.* πέπερι states that the name was likely borrowed into Greek "par la voie du commerce."

peach and apricot than for rice; or perhaps it was due to pepper's position as the driving force behind Indo-Roman trade. In any case, pepper maintained its exotic status as a spice even when its use as a medicine was thoroughly integrated into the professional's toolkit.

Through these three exotic examples, we can see how certain plants from the east were integrated into Greek and Latin medical and botanical literature, and into peoples' lives. The inquiries and cultural contact that were underway in the time of the Hippocratic physicians and Theophrastus continued until, by the time of Dioscorides, pepper, rice, and eastern stone fruits acquired nearly the same status in the technical literature as native Mediterranean plants and plant products. Yet their foreignness was not entirely masked. For the peach and apricot, their names in Greek and Latin would have been a constant reminder of their eastern origin, and for pepper, its exotic origin lingered on the tongue far after it was a routine part of medical practice.

5.2 The first century CE

After this diachronic survey, I will focus on the uses and perceptions of exotic plants—my three previous examples, among others—during a relatively short time period: from the start of the Roman principate through the end of the first century CE. I have chosen this time frame because of the relative wealth of textual sources dating to that period: on the scientific side, Pliny's *Naturalis historia*, Columella's *Res rustica*, Celsus' *De medicina*, and Dioscorides' *Materia medica*,[42] and on the literary side, the poetry of Virgil, Horace, and Martial, as well as the *Satryica*. Also, at this time Rome and the areas under its control had a more stable system of government, and Rome's dominant position in the Mediterranean was assured.

[42] This choice of time frame does eliminate two major sources (Galen and Ptolemy), though the more limited corpus of the first century allows a clearer focus.

Furthermore, trade routes with the east were being reestablished or reinvented.[43] It is not clear, however, that accurate knowledge about this new trading partner was widely available in the Mediterranean. Products preceded facts. Imagine that in a world lacking modern media, an American's knowledge of China came primarily from canned water chestnuts and imported paper parasols. This is similar to the mental constructs about India that would have been current for the average Roman in the first century CE. India was commercialized. A person's connection to this part of the wider world came through products, and thus the cognitive geographies of Romans and other Mediterranean-dwellers created an India that suited its products, though not entirely from whole cloth. Old stories about fertility and luxury were revitalized and made to fit the India that was for sale. New information about the actual place from the reports of sailors, traders, and travelers was integrated only gradually, and not significantly in the first century.

Studies of commerce and consumption often seek to explore the connections between the things consumed and the places involved in the process of consumption. In this sense, consumption is more than just purchasing and using something: it has a relational aspect that gives meaning to objects within a cultural context.[44] As such, the reasons behind specific acts of consumption are sources of information about society and culture. These reasons may include utility, pleasure, politics, and displaying solidarity with or differentiation from a given group.[45] Frequently comparisons are made between consumption in the ancient Mediterranean and consumption today, echoing a common debate between "modernists" and

[43] For the establishment of these trade routes and their expansion under Augustus, see Warmington 1928 6-10.

[44] Mansvelt 2005 6-10.

[45] Morley 2007 46-49; Wallace-Hadrill 2008 329-338; see Parker 2008 165-171 on Indian goods in particular.

"primitivists" on ancient economies.[46] Here I try, like most scholars, to steer a middle course between Rostovtzeff's expansiveness and the nihilistic view, reminiscent of Meno's paradox, that we cannot know anything about the ancient economy simply because we don't know about it.[47] However, a true consumer culture, like the one of the present day, which stems from the "consumer revolution" of the 18th century, particularly in England,[48] did not exist in the ancient Mediterranean.

Despite this, consumption and trade did occur, and there existed what have been termed "consumer cities," where consumption rather than production was the norm.[49] Rome in particular was a cosmopolitan center of consumption in the first century, and exotic and luxury objects in particular have explanatory value within the social context of consumption, as they served to mark status and to inform worldviews and cognitive geographies.[50] Purcell summarizes how Rome, as the focal point of an empire, was the destination for all booty, all beauty, and all excess.[51] Edwards and Woolf introduce a collection of essays titled *Rome the Cosmopolis* by reminding us that the Colosseum's spectators came from all over the Roman world and watched entertainment that often involved exotic beasts.[52] Hughes notes how the Romans' appetite for exotic flora and fauna was often so extreme as to damage the native

[46] See Morley 2007 2-6 for a summary of this debate: modernists see differences between ancient and modern economies as matters of quantity, not quality, whereas primitivists question the very concept of an economy as applied to non-modern systems of exchange.

[47] See Harris 2000 711, who rejects the dichotomy.

[48] Mansvelt 2005 32-35; Wallace-Hadrill 2008 319-329.

[49] Morley 2007 51. This notion has been challenged by Mayer 2012, who argues from archaeological evidence that there was abundant production in the large cities of the Mediterranean.

[50] Parker 2008 147-149 discusses how Indian goods in general contributed to this process of "mapping" in Roman minds.

[51] Purcell 2000 405-412.

[52] Edwards and Woolf 2003 1-2.

ecosystems from which it had been taken.[53] As Mansvelt discusses, studies of consumption of exotic foods in contemporary London involve an imagined source as well as a real one: the consumer is caught up in the network of consumption.[54] The paper she cites by Cook and Crang explores "introverted" and "extroverted" culinary consumption, and notes how geographical boundaries are shifted and redefined in acts of consumption: foods that are "traditional" now were not always, for instance tea in England or pasta in Italy.[55] I will explore these concepts of networks of consumption and the cognitive geographies that are created by consuming exotic products, as they apply to the Mediterranean world in the first century CE, in the following sections. Plant products, with their close connection to the land in which they are grown and from which they are obtained, have special value in these schemes.

5.2.1 India for sale

Eastern plant products were widely available in Rome.[56] Pliny reports that huge treelike Indian reeds (bamboo?) were commonly found in Roman temples (*harundini quidem Indicae arborea amplitudo, quales vulgo in templis videmus*; *NH* 16.162). In 92 CE, Domitian set up the *horrea piperata*, a district of the city of Rome for the storage, or perhaps the sale of spices.[57] These products arrived via trade networks that, thanks to recent archaeological studies, are becoming increasingly clear. Mediterranean shipwrecks from the period from 200 BCE to 200

[53] Hughes 2003.

[54] Mansvelt 2005 96.

[55] Cook and Crang 1996.

[56] For a brief overview of plant products in Roman trade, see Harris 2000 728-729. For spices in particular, Miller 1969 is the standard, though a replacement is needed.

[57] Warmington 1928 89-90; Parker 2008 153; Tomber 2008 55.

CE reveal the existence of larger and more technologically advanced Roman ships filled with trade goods.[58] Also in the Roman period, sailors began to regularly harness the monsoon winds to cross the Arabian Sea to reach ports on the west coast of India,[59] graffiti in Greek have been found on the island of Socotra off the Horn of Africa,[60] and there are traces that some scholars have interpreted as evidence for a Roman "colony" in southern India.[61] From this trade, many goods from India were available in the Roman world. Whether these processes constituted "globalization" in a modern sense, or merely an elite-driven relocation of luxury goods cannot be determined from the evidence.[62] Mayer's recent elucidation of the Roman "taberna economy," which involves small-scale trade in finished goods among non-elites would argue that trade in the ancient Mediterranean was more prevalent than any of our evidence suggests.[63]

The number and variety of items transported in this trade were prodigious, and, of course, many plant products are among them, including aromatics, spices, woods, and cotton cloth. Casson includes a five-page list of the "objects of trade" mentioned in the *Periplus* in his

---

[58] Mayer 2012 62-64.

[59] For the development of the monsoon trade, see Warmington 1928 42ff., Casson 1989 283-291, and Parker 2008 171-183, among others. Bukharin 2012 501-522 discusses early Greek contact with the island called Διοσκορίδης (modern Socotra), which is mentioned in the *Periplus of the Red Sea* as having some Greek inhabitants among other traders (εἰσὶν δὲ ἐπίξενοι καὶ ἐπίμικτοι Ἀράβων τε καὶ Ἰνδῶν καί τινα μὲν Ἑλλήνων τῶν πρὸς ἐργασίαν ἐκπλεόντων; §30).

[60] These graffiti have been found in a cave on the island, but they likely date from after the third century CE. See Bukharin 2012 494-498.

[61] The evidence consists of references in Tamil epic poetry to *yavanas* and imports of wine (analyzed in Seland 2007), archaeological finds of amphoras for wine and other Mediterranean staples, a papyrus contract for spice exports (the "Muziris papyrus" *P. Vind. G* 40822), and a reference in the Peutinger Map to a Temple of Augustus in Muziris. Casson (1986, 1989 24) believes that these are sufficient evidence, but most modern scholars are more skeptical, especially because no temple has been found in the ruins at Pattanam, which are now identified with Muziris (Tomber 2008 140-143): see Seland 2007, Tomber 2008 148-154; and Parker 2008 165-171.

[62] Morley 2007 94-96 argues that the driving force behind Roman trade was political unity, not economics.

[63] Mayer 2012 66-70.

edition of the text,[64] and Tomber includes an even longer chart of the items turned up by excavations in Egypt, including some plant products (coconut and mung beans) that are unmentioned by any textual source.[65] It would be tedious and repetitive to go through a list of plant products. Warmington methodically goes through textual evidence for everything from pepper to plantains.[66] Here I will mention only a few plants that I have not already surveyed in section 5.1.

First, the Indian eye medicine, called λύκιον ’Ινδικόν in Greek and *lycium* in Latin. The influence on Roman medicine of Indian medical practices is hotly debated,[67] but the use of Indian pharmaceuticals was widespread and growing during the early principate.[68] Lycium in particular was a common medicine from India, identified either with an extract from the wood or bark of a species of barberry (*Berberis*) native to the Himalayas or with an extract from the wood of *Acacia catechu* called “cutch,” which is still used in traditional Indian medicine[69]. Indeed, the branding of this product was important. Small ceramic jars labeled LYKION have been found in southern Italy, the label boasting of the precious contents.[70] Dioscorides first describes λύκιον as being a tree like the acanthus (δένδρον ἐστὶν ἀκανθῶδες), and says that it grows in many places, including Cappadocia and Lycia (1.100.1). Later, though, he describes an Indian variety that comes from a shrub called λογχῖτις, which also resembles the acanthus.

[64] Casson 1989 39-43.

[65] Tomber 2008 71-87.

[66] Warmington 1928 180-234. See also Parker 2008 150-158.

[67] Majno 1991 374-381 sees much Indian influence on Roman medicine, including cataract surgery and plastic surgery (for torn earlobes) as well as drugs. See also Filliozat 1949 161-198.

[68] Cf. pepper, of course.

[69] Casson 1989 192-193, leaning toward the latter identification.

[70] Warmington 1928 205; Majno 1991 377.

Warmington rightly unites these two forms of lycium and takes Dioscorides' statements as evidence of changing trade patterns: first lycium was traded overland and was thought to come from Asia Minor, and later it came from India by sea (1928 205-206). The *Periplus of the Red Sea* reports that lycium is available from the north Indian ports of Barbarikon and Barygaza (§§39 and 49). Pliny describes the preparation of the medicine at *NH* 12.30-31 and 24.125-127, and in the latter passage he gives a description of the Indian variety so it can be told apart from imposters and adulterated versions.

Second, Indian cotton fabric. Warmington declares that Indian cotton was "of greater importance than ordinary Roman literature would lead us to suppose,"[71] and imported cotton (presumably from India) has been found at both Berenike and Myos Hormos in Egypt.[72] In fact, cotton has been found in a fifth-century BCE context at an excavation in the modern district of Trachones in Athens.[73] Cotton's low profile in literature is partly due to the confused nomenclature for the fabric. The ἔριον ἀπὸ ξύλου of Herodotus and the Alexander historians (see chapter 2) was later known as σινδών, κάρπασος, βύσσος, *xylon*, *byssus*, and *gossypium*, among other names, and these names could also be applied to fine linen fabric and sometimes even to Chinese silk.[74] An example of this difficulty can be found in Strabo, who refers to both σινδών and κάρπασος as Indian textiles (ὡς δ' εἰπεῖν, Ἰνδοὺς ἐσθῆτι λευκῇ χρῆσθαι καὶ σινδόσι λευκαῖς καὶ καρπάσοις; 15.1.71). One of these cloths is surely cotton, but which? Pliny (*NH* 19.14) uses *gossypium* and *xylon/xylina* of Egyptian cotton, and leaves the Indian variety

[71] Warmington 1928 210. Virgil mentions cotton only once in the *Georgics*, and there it comes from Ethiopia, not India (*nemora Aethiopum molli canentia lana*; 2.120). Cotton plants (members of the genus *Gossypium*) did grow in Ethiopia as well, but the cotton most useful for garments came from India.

[72] Tomber 2008 84.

[73] Zisis 1954.

[74] Warmington 1928 210; Parker 2008 156-157.

unnamed, saying only that the *Indi* prepare thread from apples (*mala*).[75] But when he copies Theophrastus' account of the cotton on the island of Tylos (modern Bahrain), he also uses the name *gossypium* (*NH* 12.39). The text that gives us the best access to the cotton trade is the *Periplus of the Red Sea*, which mentions cotton as part of both the Indo-Roman trade (§§41, 48, 49, 51, 59, and 63) and as part of the trade with ports south of Roman Egypt and in Arabia (§§6, 14, 31, and 32). In this text, κάρπασος is used for the cotton plant and σινδόνες for cotton clothing.[76] In addition to these references, we can infer the availability in Rome of fine cloth from the east by the inclusion of "promiscuous garments" in the list of luxurious vices by Tiberius in his speech to the Senate in 22 CE (Tacitus, *Annals* 3.53).

Third, the wood of the ebony tree, one of several exotic woods exported from India. Here as well there is a longstanding confusion about its place of origin. Herodotus places it in Ethiopia (3.97), but Theophrastus states that it is exclusively an Indian product (ἴδιον δὲ καὶ ἡ ἐβένη τῆς χώρας ταύτης; *HP* 4.4.6).[77] Virgil follows Theophrastus in locating ebony in India only (*sola India nigrum / fert hebenum*; *Georgics* 2.116-117). Dioscorides recognizes both an Ethiopian variety of ebony and an Indian, and states that the Ethiopian is more potent (κρατίστη; 1.98).[78] Pliny mentions both Virgil and Herodotus when he discusses ebony:

> unam e peculiaribus Indiae Vergilius celebravit hebenum, nusquam alibi nasci professus. Herodotus eam Aethiopiae intellegi maluit in tributi vicem regibus Persidis e materia eius centenas phalangas tertio quoque anno pensitasse Aethiopas cum auro et ebore prodendo. (*NH* 12.17)

[75] The unopened cotton boll does indeed resemble a small apple. Theophrastus compares it to a spring apple (μῆλον ἐαρινόν) at *HP* 4.7.7.

[76] Casson 1989 292-293.

[77] He does not mention the provenance when he discusses the use of ebony wood for treating eye diseases (*HP* 9.20.4).

[78] See Scarborough 1978 383-4 for the medicinal uses of ebony wood.

> Virgil praises the ebony as one of India's specialties, saying that it grows nowhere else. Herodotus prefers it to be found in Ethiopia, and that every third year the Ethiopians paid a tribute of 100 *phalangae* from the wood of this tree to the kings of Persia, along with giving gold and ivory.

The imagined geography here in the phrase *Aethiopae intellegi maluit* is staggering. Does ebony grow in Ethiopia or not? Herodotus does not get to "prefer" it to come from Ethiopia if it is actually Indian. Neither of these places is real enough in Pliny's mind for this question to occur to him. When in a separate book he lists the remedies that come from ebony, he is only slightly less vague about its native region: it does not grow in Egypt (*ne in Aegypto quidem nascitur hebenus*; *NH* 24.89). The *Periplus* does not help to clear up these clouded conceptions. It only mentions ebony as an export from India to the Persian port of Omana and not to Roman Egypt (§36). In fact, ebony wood came from both India and Ethiopia;[79] its confused geography is due to changing patterns of trade: Herodotus knows it from Egypt, which sources its ebony from Ethiopia, and from the Persian court, which received a tribute from Ethiopia (3.97 and Pliny *NH* 12.17, quoted above). Theophrastus knows a different region of the world, and places ebony in India. Later authors then deal with this conflict in different ways, including Pliny's odd use of preferential cognitive geography.

For each of these three products we see to differing degrees how the impact of the concept of India resounded in its plant products. This is clearest in the case of ebony wood, which came from a tree that had to have grown *somewhere*. The different origins given for ebony in our written sources testify to India's place on the hazy outer edge of the world, far enough away from the everyday to be simultaneously nowhere and in multiple places. For lycium, the exotic nature of its origin could be played up to enhance its supposed medicinal

[79] Meiggs 1982 282-286.

qualities. Cotton, as well as our previous example of pepper, came with a different connotation: luxury. The weight of that label will be explored in the following section.

5.2.2 Luxury and imagined geography

Luxury is hard to define for modern historians, but it certainly existed as an ancient concept.[80] For Romans, it was connected intimately with the eastward expansion of their empire. Livy famously states that luxury began in Rome in the year 186 BCE, after Gnaius Manlius Vulso's triumph in Asia Minor: *luxuriae enim peregrinae origo ab exercitu Asiatico invecta in urbem est* (Livy 39.6).[81] By the first century CE, luxury and discourse about it were entrenched in literary culture and society at large, and the connection with the exotic east remained. Seneca, as one might expect of a Stoic, writes disapprovingly of globalized gluttony:[82]

> ultra Phasin capi uolunt quod ambitiosam popinam instruat, nec piget a Parthis, a quibus nondum poenas repetimus, aues petere. undique conuehunt omnia nota fastidienti gulae; quod dissolutus deliciis stomachus uix admittat ab ultimo portatur oceano; uomunt ut edant, edunt ut uomant, et epulas quas toto orbe conquirunt nec concoquere dignantur. (*Consolatio ad Helviam* 10.3)
>
> They want produce caught beyond the Phasis with which to supply a showy kitchen; they are not ashamed to source fowl from the Parthians, from whom we have not yet received recompense for grievances. They draw all known things together from all sides for their over-refined throats. Food that their stomachs, worn out by delicacies, can scarcely get down is brought from the farthest ocean. They vomit to eat; they eat to vomit. They do not deign to digest the feasts which they seek out from the entire earth.

[80] Morley 2007 40-43.

[81] See Wallace-Hadrill 2008 315.

[82] Edwards and Woolf 2003 2 comment on how Rome's appetite for luxurious foodstuffs increased as its empire grew.

The pun that ends this passage, between *conquiro* "seek out" and *concoquo* "digest" is apt: if consumption were plotted in two dimensions, distance versus cost, luxury would occupy the sector of the plot that combined high cost with great distance. Each of these factors influences the other in creating the luxury concept: a product from far away could justify expensiveness, and conversely a high price could lend credence to stories of a distant origin. Additionally, because of Rome's cosmopolitanism,[83] the way these commodities were thought about in mental geographies was, in a way, the "mapping of Rome."[84] In literary sources, these geographies are often constructed with a very negative, moralizing tone. Warmington traces moralizing against eastern luxury in the period following the discovery of the monsoon trade in Pliny, Petronius, and Christian authors.[85] In this section, I will focus on Pliny. The two factors important here in this discussion are the two axes of ancient luxury: distance and cost.

Naturally, screeds against luxury were often based on the cost of luxury products, and tap into existing Roman views of the ethics of trade. Thus, in this account of the conceptualized geography of India, the cost of Indian goods is of some concern. Making a profit through commerce was frowned upon by moralizing Roman authors from the earliest Latin prose. Cato the Elder states at the beginning of his *De agricultura* that making money by trade is difficult and arduous, as well as dangerous and prone to failure: *mercatorem autem strenuum studiosumque rei quaerentae extimo, verum ... periculosum et calamitosum* ("I believe trade is difficult and requires much effort to gain profit and is ... dangerous and prone to failure;

[83] See chapter 2 and Naas 2011.

[84] Parker 2008 201-202.

[85] Warmington 1928 38-39.

praef.3).[86] Additionally, trade with the east was a way for Rome to spend all the gold it had obtained from its conquests, something that was a source of concern for authors in the early Empire. Pliny bemoans the expense of eastern imports more than once in the *NH*. At 12.84 he computes that the minimum spent on eastern imports is 100 million sesterces, money which is being spent on "women and delicacies" (*mimimaque computatione miliens centena milia sestertium annis omnibus India et Seres et paeninsula illa [sc. Arabia] imperio nostro adimunt. tanti nobis deliciae et feminae constant*), and at 6.101 he attributes 50 million of the total to India (*nullo anno minus HS•D imperii nostri exhauriente India…*).[87]

Despite these negative references to the cost of eastern trade—the vivid use of the verb *exhaurio* to refer to India's draining of Rome's gold and a scornful note to women's taste for expensive things—Beagon argues that for Pliny, making a living by trade is not bad necessarily, but recklessness in pursuit of profit is to be discouraged and high prices need to be justified by high quality merchandise.[88] In terms of medical imports in particular, Beagon shows that Pliny's objection to expensive eastern medicine is not due solely to its cost:[89] if the medicine was better than cheap local alternatives, it would be worth the higher cost, but, in Pliny's view, even exotic medicine is often not worth it, as we will see below.

Pliny and other authors do not content themselves to complain about only the cost of luxury. Geographical notions about the source of this luxury are important for explaining

[86] See Morley 2007 82-85 for more on this trope in other writers, including Varro. Interestingly, this trope is not found to such a great extent in later authors, especially those from the equestrian class such as Columella and Pliny the Elder. See Beagon 1992 190-193 and below on Pliny's attitudes toward making money by trade.

[87] Parker 2008 183-187 argues that while Pliny's figures may be exaggerated for moralizing purposes, they are not outside the bounds of possibility for the Indo-Roman trade. See also Warmington 1928 272ff., who traces Rome's "trade deficit" and correlates it with Roman gold and silver coin hoards found in South India.

[88] Beagon 1992 180-193.

[89] Beagon 1992 202ff.

their attitudes as well. Parker theorizes that Pliny's description of Indian goods provides a "geography" to a greater extent than previous authors', due to increased "map-mindedness" in the Roman period.[90] Roman reactions to luxurious and expensive goods from the east often branded them as superfluous or useless, and these reactions spanned all ranges of their application, from clothing to food to medicine.[91] Tiberius' statement of his inability to control the Romans' penchant for luxury was noted above, and, predictably, Pliny laments the Romans' over-reliance on exotic herbs for healing:

> haec sola naturae placuerat esse remedia, parata vulgo, inventu facilia ac sine inpendio e quibus vivimus. postea fraudes hominum et ingeniorum capturae officinas invenire istas, in quibus sua cuique homini venalis promittitur vita. statim compositiones et mixturae inexplicabiles decantantur, Arabia atque India remedia aestimantur, ulcerique parvo medicina a Rubro Mari inputatur, cum remedia vera cotidie pauperrimus quisque cenet. nam si ex horto petantur aut herba vel frutex quaeratur, nulla artium vilior fiat. ita est profecto, magnitudine populus Romanus perdidit ritus, vincendoque victi sumus. (*NH* 24.4-5)
>
> Nature had desired that medicines be only these things among those we live off of that are commonly available, easy to find and without expenditure. Afterward, human deceit and the greed of clever folk came up with those workshops in which each person is offered life, for sale. All of a sudden potions and intricate mixtures are praised, Arabia and India are considered cure-alls, and medicine from the Red Sea is applied for a small sore, as all the poorest dine daily on the real cures. For if herbs are gotten or shrubs sought from the garden, no other art would be more affordable. Thus it is clear that the Roman people have destroyed their customs by growing too large, and we have been conquered by the act of conquering.

Here, foreign places are constructed as locations to hold the negative reactions Pliny has to the behavior of his contemporaries. Luxury is once again portrayed as a consequence of empire-building, as well as a drain on the pocketbook. But at the same time morals enter into it. Deceit (*fraus*) and greed (*captura*) are given as cooperating causes to the problem of luxury. Pliny's overt rejection of luxury goods may be more of a moralistic showpiece than a reflection

[90] Parker 2008 152. His explicit comparison is to Theophrastus.

[91] Parker 2008 165-171.

of his beliefs,[92] but in the case of goods from the east, Pliny uses the physical distance that separates Rome from India and Arabia to make the foreign places the scapegoat for what he views as social and moral failings at home, which may not be due to *luxuria* at all. After all, the *ingenii* who are praising these new, expensive remedies are resident at Rome, not abroad in India. This distancing process is facilitated by a high-contrast, stereotyped view of India and the east as mythical lands and not real places. It is easier to foist views on a place that you know little about.

Here it is instructive to step back from Pliny and compare the geographies presented by two other authors on India. I mentioned in chapter 2 Strabo's contempt for sailors and traders as sources for his *Geography*. Instead of relating reports from these disreputable sources, he instead presents snippets of the accounts of the Alexander historians. For modern scholars, this is very beneficial, as Strabo preserves information that would otherwise have been lost.[93] But for a reader living in Strabo's time, the India in his text is two centuries out of date. When we contrast Strabo's account with that of the *Periplus of the Red Sea* (probably half a century later in date), the divergence from reality is clear. The *Periplus* lists ports, trade goods, and itineraries: the practical needs of merchants involved in the Indian trade. Strabo's India is the India of Alexander and myth;[94] the India of the *Periplus* is the real first century India: a supplier of luxury goods. Yet the *Periplus*, despite any praise I might give for its accuracy, was not a widely circulating text, at least among the literary elite. Thus the mental map of India that one sees in the texts of Strabo and Pliny is mythologized and distanced.

[92] Lao 2011 takes an interestingly different view of Pliny's motives and highlights how Pliny's advice about different varieties of pears and grapes would be useful for connoisseurs, and that Pliny's tendency to note which products can be adulterated is due to market-mindedness and an eagerness to catch cheaters in both the goods and intellectual markets.

[93] Arrian is a similar case, though his *Indica* dates from the second century and beyond my self-imposed endpoint.

[94] Parker 2008 makes the point that Roman experience of India was often mediated by Alexander.

The final picture that emerges from this is that Indian commodities are situated as luxuries both via their cost and via a kind of moralizing geographical distancing that involved a static image of India. In these authors' worldviews, India as a source of consumable luxuries is conceived of as the same "golden age" India that is described by Megasthenes and Onesicritus. The embellished truth was more appealing to consumers of luxury products, and was seemingly more appropriate. Furthermore, as Pliny laments, the value of a luxury good increased when it was connected with India, which was seen as a mythical place of fertility and abundance. In this way, the commodification of India was accompanied by its mythologizing. Its distance (in time and text) was made to correspond to the cost of its products. A corollary to the above statement would be that the cost of an Indian import good would be lessened either if it was connected with the realities of India (the ships and sailors of the monsoon trade) rather than with a mythologized place, or if it was somehow altogether disconnected from the semantic field of luxury. An example of the latter process is provided by pepper.

5.2.3 Another look at pepper

Pepper is often singled out as notable for its connections to luxury, so it is only fit to return to it to close this section on the conceptualization of India through its commodities. As has been shown above, pepper had a strong connection to luxury in early authors. But by the later part of the first century CE, pepper was widely available and was relatively inexpensive: Pliny reports that long pepper cost 15 denarii per pound, white pepper 7 and black pepper 4 (*NH* 12.28).[95] Pepper became a luxury for the masses, a piece of India that was within the

[95] Warmington 1928 226ff. compares the cost of various Indian imports, concluding that pepper's "very abundance tended to cheapen it" (232). Other Indian spices, such as cinnamon, cost upwards of 40 denarii per pound.

means of a common person to purchase. Morley notes that "it is precisely those whose diet is basic and unvaried who will have the greatest need for flavourings."[96] And pepper was quite a flavoring; its bite and pungency was unlike anything else available in the ancient Mediterranean, and a taste for it quickly spread through all social classes. In this process, pepper's connection with luxury and the mythical east was destroyed. Pliny does moralize against pepper in a way similar to his diatribes against other imports. But his opinions are half a century out of date when he notes that pepper is not consistent with the *mores* of the *antiqui*:

> hortorum Cato praedicat caules.... horti maxime placebant quae non egerant igni parcerentque ligno, expedita res et parata semper, unde et acetaria appellantur, facilia concoqui nec oneratura sensus cibo et quae minime accenderent desiderium panis. pars eorum ad condimenta pertinens fatetur domi versuram fieri solitam atque non Indicum piper quaesitum quaeque trans maria petimus. (*NH* 19.57-58)
>
> For Cato, the cabbage stood above other garden vegetables.... They [*sc. antiqui*] thought best those garden vegetables that did not require fire and were sparing of wood, a resource that was always ready and at hand, from which fact they are called salads, that are easy to digest and not likely to overwhelm the senses when eaten, and which would least kindle a desire for bread. The portion of these that are used as condiments attest that commerce used to happen at home and neither Indian pepper was sought nor those other things we get from across the sea.

Pliny rejects pepper's symbolism, not its price. But the contrast he draws between buying *domi* and *trans maria* is not a living concern to his contemporaries, as his use of the past tense shows.[97] Pepper was cheap and common and no thus longer was exotic in the same way it once had been.

Pliny's reported cheapness of pepper in the second half of the first century is tracked by its representation in literature. Even in technical literature, it is clear that pepper was not restricted to the upper classes. In Columella's collection of recipes for the farm overseer's wife (*vilica*), he includes several salads and digestives (*oxypori*) that make use of pepper in various

[96] Morley 2007 47.

[97] Morley 2007 47.

forms: white and black pepper as well as peppered vinegar (*acetum piperatum*; *RR* 12.59). These are simple foods, and not the stuff of Apicius. And when Martial writes of pepper in his epigrams, it is not as a mark of luxury, or as a stand-in for the exotic east. It is cheap and commonplace. For instance, in epigram 4.46 one and a half pounds of pepper is listed among other cheap gifts for Saturnalia and in 10.57 the poet scolds his friend for sending him half a pound of pepper instead of the pound of silver he used to send, implying that the friend got a bad price for the pepper if it cost as much as the silver: *tanti non emo, Sexte, piper*. Pepper's change of status is most clearly evident in epigram 3.2. Here Martial employs the same image that Horace did at the end of *Epistle* 2.1: poetry being used as a wrapping for pepper. But the meaning has altered entirely. Horace's image of pepper and incense follows his statement of his inability to write proper praise poetry of Augustus. The force of this image is that a valuable substance is wrapped in worthless scrap, much like Augustus would be if praised by Horace. Martial, however, fears this sort of outcome as being a desacration of his work: in his image the things to be wrapped are not only pepper and *tus*, but also *cordyla* (tunny fry). Here, rather than implying that his poetry would degrade the substance contained, Martial fears the pepper would taint his writing. Pepper is not viewed as a high-status luxury item to be wrapped in worthless paper, but as something worthless that Martial's priceless poetry might be forced into contact with.

Pepper's evolution from a high-status item on the tables of the rich to a lowly luxury for the masses in a relatively short timeframe is instructive. The ready availability of India via pepper was met with a reaction that might have been expected: what was once scarce and

valuable, the stuff of legend and adventure,[98] became just something else for sale at the market. Nevertheless, pepper was unlike anything else that was available, and its use as a medicine continued unabated: some of its exoticism remained, but for a lower price.

5.3 Conclusion

Tacitus reports that the extravagance of the Augustan age died away not because of sumptuary legislation, but because of the influence of Vespasian (*Annals* 3.55). Part of this change, particularly as it related to eating habits, is relatable to the greater availability of exotic edibles, especially pepper. Since Roman sumptuary legislation was usually expressed in terms of an allowed expenditure, rather than banning specific foods,[99] the expense involved in eating luxuriously would go down in real terms as the luxury products became more available. This removes the cost stigma from the goods' luxury status. Concomitant with this goes the Roman tendency to bring the world to Italy and make everything native. This "nativizing" of the exotic removes the distance stigma from luxury goods. I discussed above Pliny's creation of "Italian pepper," and I give here another similar example from a very different piece of literature. In the *Satyrica*, a guest at Trimalchio's feast describes his host's efforts to import and grow foreign produce, with special reference to Indian mushrooms:

> "mel Atticum ut domi nasceretur, apes ab Athenis iussit afferri; obiter et vernaculae quae sunt, meliusculae a Graeculis fient. ecce intra hos dies scripsit, ut illi ex India semen boletorum mitteretur." (*Satyrica* 38)
>
> "He [*sc.* Trimalchio] ordered bees brought from Athens so he could produce Attic honey at home. Plus, even the local bees will be a bit better from the Greek ones. And just the other day he sent off for mushroom spores from India."

[98] Parker 2008 191-195 discusses how trade with India mediated between the contact of the consumer and that of a founder figure, often Alexander the Great. This discussion does not note, however, the changing nature of Roman consumption of Indian goods.

[99] Dauster 2000 66. See also Aulus Gellius, *Noctes Atticae* 2.24 and Macrobius, *Saturnalia* 3.17.

The absurdity of this anecdote is of course the point. But the notion of creating a mini-India in Italy is not at all absurd. The conception of exotic India is seen in its commodities, particularly those derived from plants (or fungi, as the distinction between the two was not recognized). Bringing these to Rome incorporates them into the fabric of the city and thereby their value as societal markers is altered.

From the beginnings of rice, pepper, plums, and peaches in the Mediterranean through the use of Indian products in the first century CE, this chapter has been an exploration of the ways Greeks and Romans worked with the physical plant products that were coming from the east. These products occupied the cultural space of luxury goods, defined by their high cost and foreignness, much to the dismay of some Roman traditionalists, and as medicines. In both cases, much of the value of these imports came from the mental geographies of India that were conjured up in connection with their consumption. Connections with a mythologized India were important for the marketing of luxury goods, and this, in turn, served to fossilize the image of India in the minds of the consumers of its products. The very real plant products that grew in India and were transported, sold, and resold along the itineraries given in the *Periplus of the Red Sea* were transformed upon entering the Greek and Roman spheres, becoming associated with images of an India of the imagination.

6 Conclusions

yatronmattabhramaramukharāḥ pādapā nityapuṣpā
haṃsaśreṇīracitaraśanā nityapadmā nalinyaḥ |
kekotkaṇṭhā bhavanaśikhino nityabhāsvatkalāpā
nityajyotsnāpratihatatamovṛttiramyāḥ pradoṣāḥ ||

Where trees, always in bloom, buzz with drunken bees,
and always-bearing lotus pools are bounded by a girdle of geese,
and peacocks, their necks stretched to crow, have always-shining tails,
and evenings are always moonlit, pleasant from the prevention of darkness.

This description of the environment of the mythical city of Alakā is found in Kālidāsa's *Meghadūta*,[1] a short Sanskrit poem written in the persona of a *yakṣa* (nature spirit), who, exiled from Alakā and his beloved wife, addresses a cloud (*megha*) and instructs it to go to his wife as a messenger (*dūta*). As the *yakṣa* makes his request, he narrates an imagined journey in the sky from central India north to Mt. Kailāsa in the Himalayas, portraying a lush and luxuriant India that is not altogether different from the one that we have found in Greek ethnographic accounts of the country. The similarity here is not, of course, due to any borrowing on Kālidāsa's part, but rather to universal human tendencies to ascribe extreme fruitfulness to their utopias. We have seen the results of this tendency in Greek and Latin literature in the preceding chapters. Now it is time to examine the results of using India as a test case for a study of the place and value of exotic plants in various aspects of the Greek and Roman worlds. How has my focus on India elucidated these issues, and where could scholarship on plants and their meanings go from here?

[1] This particular verse is number 70 in Pathak's 1916 edition of the text, which is derived from the *Pārśvābhyudyaya,* in which the Jain scholar Jinasena incorporates each *pāda* (quarter-stanza) of Kālidāsa into a larger work on the life of Pārśvanātha, the 23rd Tirthanakara. The verse does not appear in the main text of Hultzsch's 1911 edition of the *Meghadūta*, but is relegated to his appendix of spurious verses. Pathak 1916 xvi-xx condemns Hultzsche's excision of the verse, arguing that Jinasena's testimony should be given higher value and that even Vallabha, the earliest extant commentator on Kālidāsa, has commentary on these verses in a few MSS, which Hultzsch neglects to print. Pathak, however, is going against the view of Mallinātha, a later commentator on the *Meghadūta*, from whose commentary on these lines he is required to omit Mallinātha's view that this verse is *pratikṣipta*—interpolated.

6.1 The test case of India

Throughout this dissertation, I have demonstrated how the Greeks and Romans interacted with plants and plant products coming from the east, particularly from India, which I designated my "test case" in chapter 1. Schematically, these interactions can be classified as belonging to ethnography (chapter 2), symbolism of territory and imperialism (chapter 3), science and taxonomy (chapter 4), and consumption (chapter 5). Focusing on plants and keeping India always in mind has allowed me to reach various conclusions.

In chapter 2 I focused on the use of plants in Greek and Roman ethnographic accounts of India. Here India served its purpose as a frequent subject for ethnographic musings, from before Herodotus' time to the time of Augustus' principate and beyond. In the chapter, I showed how various theories about human and cultural development—as well as ideas related to the νόμος-φύσις debate—could be seen in the way authors wrote about exotic flora. Plants provided a way to see how deeply these issues had set their roots into writing about foreign cultures and civilizations. Plants such as the olive were viewed as important markers of civilizational achievement, and the half-wild olive in India raised important questions about the status assigned to its peoples by Greek and Roman intellectuals. Their Indians were neither uncivilized nor civilized; though they existed in a place that was eternally foreign, they displayed markers of cultural advancement, including growing and cooking a staple grain (rice) and making clothing out of a plant fiber (cotton). Though the specific plants used here were unfamiliar to Greeks (who would have used wheat or barley and flax), they recognized these plants as the accouterments of a type of culture that was neither similar nor utterly opposed to their own.

India in chapter 3 provided an occasional comparison to developments in the Near East: there was no early tradition of palace gardens there, but Aśoka nevertheless was able to express some imperial concepts through the use of plants (as preserved in his Pillar and Rock Edicts). The symbolic meaning of exotic or foreign plants was paramount in this chapter: they could represent the land from which they were taken in a way that no other object could. The development of palace gardens and *paradeisoi* was also a major concern of mine, and I showed how exotic plants were used by Assyrians, Persians, Seleucids, and Romans in different ways to differing effects. The constant feature that unites all of their gardens is the symbolic power of a plant, a power that arises from the plant's always having "roots" in its native land.

Chapter 4 focused on a single author, Theophrastus, and how he developed a theoretically-based science of botany. I attributed his divergence from Aristotle's single final cause to his study of plants, cultivated ones in particular, whose τέλη seem to be both to grow useful produce for humans and to reproduce. I then turned to how Theophrastus integrated and evaluated information on new plants by comparing his treatments of plants from Egypt and from India. As before, India was my test case, but the results from Egypt were often just as useful. Though he had more knowledge about Egypt and Egyptian flora was more understood in his treatises, Theophrastus mentions the need to continue research with regard to each of these locations. India, though it contributes a few novel plants to the *HP*, is not unique. It is the study of exotic plants in general that animated Theophrastus' research and caused him to rethink the purpose of plants. An expanded focus on Theophrastus' accounts of *all* exotic plants—how does their treatment differ from that of common plants?—and on when he remarks on the need for further inquiry—is it more often for exotic flora?—could yield more information about his scientific process and the various editions of his botanical treatises.

I turned to a more basic way of interacting with plants in chapter 5, though my study of consumption revealed more than just the fact that products derived from Indian plants gradually became known in the Mediterranean world and could even be termed common in the first century CE. In this chapter, my focus on India was particularly beneficial, because it allowed me to control for the effects of empire. Since India was never under Greek or Roman control, its products would be characterized as exotic without ever being colonial. Pepper was never sent as an imposed tribute, though it might be portrayed that way in a literary account. The story of Indian pepper in particular shed light on changing attitudes, which included its medical use from an early period, particularly for diseases of women; Dioscorides' grouping of pepper with pungent Mediterranean plants; Pliny the Elder's preference for local herbs; satirists' use of pepper as a marker of the profligacy of their targets; and, surprisingly, Martial's dismissal of pepper as a cheap substitute for real luxury goods. A gamut of reactions to India is visible in this one spice: disapproval, moralizing, mockery, and integration into systems of knowledge.

In sum, using India as a test case has had mixed results. Perhaps I could have achieved a wider comparative perspective in chapter 2 or in chapter 4 by expanding my scope to additional exotic regions. But in chapter 5, India was the ideal test case to examine the consumption of exotic plant products and in chapter 3 it provided useful comparative data to Near Eastern and Mediterranean gardens. A mixed review, therefore, but this does not decrease the usefulness of my plant-based approach. The plants themselves have provided both the data and the way of interpreting it, and they have thereby proved themselves to be a valuable way to look at cross-cultural interactions in the ancient Mediterranean.

6.2 The power of plants

In the first chapter, I tried to explain why I wanted to use plants to examine culture. Much of my reasoning depended on the deeply rooted connection specific plants have to their native places. From these roots grow the various meanings plants can have. I have looked at exotic plants from theoretical, scientific, and symbolic angles, with different emphases in each chapter. Plants have shown us a flowering of ways in which Greeks and Romans tried to conceptualize exotic cultures and peoples: they have been a symbolic vehicle for expressing hegemony, they have been studied by scientists and doctors, and they have been valuable to understanding the mental constructs of India that resulted from consumption of Indian products. This approach has borne fruit, as it were. As mentioned above, this project could be expanded from Indian flora to plants from all places that were exotic to Greeks and Romans. From this a more nuanced picture could emerge of the functions of exotic plants in day-to-day life, in medicine and science, and in conceiving of the wideness of the world.

Bibliography

Texts and Translations

Amigues, S. 1988-2006. *Théophraste: Recherches sur les plantes,* 5 vols. Paris: Belles Lettres.

Amigues, S. 2012—. *Théophraste: Les causes des phénomènes végétaux.* Paris: Belles Lettres.

Beck, L.Y. 2005. *Pedanius Dioscorides of Anazarbus De Materica Medica*. Hildesheim: Olms.

Bhat, M.R. 1981. *Varāharamihira's Bṛhat Saṃhita*, 2 vols. Delhi: Motilal Banarsidass.

BNJ = Worthington 2006—.

Casson, L. 1989. *The Periplus Maris Erythraei: Text with Introduction, Translation, and Commentary*. Princeton: Princeton University Press.

Drossaart Lulofs, H.J. and E.L.J Poortman. 1989. *Nicolaus Damascenus De Plantis: Five Translations*. Amsterdam: North-Holland.

Dutt, M.N. 1979. *Manusmṛti, a Literal Prose English Translation*. Varanasi: Chaukhamba Amarabharati Prakashan.

Einarson, B. and G.K.K. Link. 1976-1990. *Theophrastus: De Causis Plantarum,* 3 vols. Cambridge, MA: Harvard University Press.

Fortenbaugh, W.W., P.M. Huby, R.W. Sharples, and D. Gutas. 1992. *Theophrastus of Eresus: Sources for his Life, Writings, Thought, and Influence*, 2 vols. Leiden: Brill.

FGrH = Jacoby 1923-1958.

Geiger, W. 1950. *The Mahāvaṃśa or the Great Chronicle of Ceylon*. Colombo: Government Information Department.

Gow, A.S.F. and A.F. Scholfield. 1979. *Nicander: The Poems and Poetical Fragments*. New York: Arno Press.

Gutas, D. 2010. *Theophrastus On First Principles (known as his Metaphysics)*. Leiden: Brill.

Hort, A. 1916-1926. *Theophrastus: Enquiry into Plants*, 2 vols. Cambridge, MA: Harvard University Press.

Hultzsch, E. 1911. *Kalidasa's Meghaduta: Edited from Manuscripts with the Commentary of Vallabhadeva*. London: Royal Asiatic Society.

Jacoby, F. 1923-1958. *Die Fragmente der griechischen Historiker*. Berlin and Leiden: Weidemann and Brill.

Kassel, R. and C. Austin, eds. 1983—. *Poetae Comici Graeci*. Berlin: De Gruyter.

Kock = Kock, T., ed. 1880-1888. *Comicorum Atticorum Fragmenta*. Leipzig: Teubner.

Lenfant, D. 2004. *Ctésias de Cnide: La Perse, L'Inde, Autres fragments*. Paris: Belles Lettres.

Nichols, A. 2011. *Ctesias on India*. London: Bristol Classical Press.

Pathak, K.B. 1916. *Kalidasa's Meghadūta or the Cloud-Messenger (as Embodied in the Pārśvābhyudaya) with the Commentary of Mallinātha, Literal English Translation, Variant Readings, Critical Notes, Appendixes, and Introduction*. Pune: Aryabhushan Press.

PCG = Kassel and Austin 1983—.

Pomeroy, S.B. 1994. *Xenophon: Oeconomicus: A Social and Historical Commentary*. Oxford: Clarendon Press.

Radt, S. and R. Kannicht, eds. 1999. *Tragicorum Graecorum Fragmenta*, 2nd ed., vol. 4. Göttingen: Vandenhoeck & Ruprecht.

Sastri, J.L. 1983. *Manusmṛti with the Sanskrit Commentary Manvartha-Muktāvalī of Kullūka Bhaṭṭa*. Delhi: Motilal Banarsidass.

Sen, A. 1956. *Asoka's Edicts*. Calcutta: Indian Publicity Society.

Sircar, D.C. 1967. *Inscriptions of Aśoka*. Delhi: Government of India.

Thomas, R.F. 1988. *Virgil: Georgics*. 2 vols. Cambridge: Cambridge University Press.

TrGF iv = Radt and Kannicht 1999.

van Raalte, M. 1993. *Theophrastus Metaphysics*. Leiden: Brill.

West = West, M.L., ed. 1989. *Iambi et Elegi Graeci ante Alexandrum Cantati*, 2nd ed. 2 vols. Oxford: Clarendon Press.

Worthington, I., ed. 2006—. *Brill's New Jacoby: The Fragments of the Greek Historians*. www.brillonline.nl.

Secondary Literature

Almagor, E. and J. Skinner. 2013. *Ancient Ethnography: New Approaches*. London: Bloomsbury.

Amigues, S. 2004. "Le Silphium: État de la question." *Journal des savants* 2004:2, pp. 207-226.

Andersen, Ø. 1976. "Aristotle on Sense-Perception in Plants." *Symbolae Osloenses* 51, pp. 81-86.

Andrews, A.C. 1963. "Plant Symbolism on Greek Coins." *Economic Botany* 17:4, pp. 317-318.

Badian, E. 1961. "Harpalus." *Journal of Hellenic Studies* 81, pp. 16-43.

Beagon, M. 1992. *Roman Nature: The Thought of Pliny the Elder*. Oxford: Clarendon Press.

Beagon, M. 2011. "The Curious Eye of Pliny the Elder," in Gibson and Morello 2011, pp. 71-88.

Bernard, P. 2008. "The Greek Colony at Aï Khanum and Hellenism in Central Asia," in F. Hiebert and P. Cambon, eds., *Afghanistan: Hidden Treasures from the National Museum, Kabul.* Washington, DC: National Geographic Society, pp. 81-105.

Blackwell, C.W. 1999. *In the Absence of Alexander: Harpalus and the Failure of Macedonian Authority*. New York: Peter Lang.

Bos, A.P. 2010. "Aristotle on the Differences between Plants, Animals, and Humans and on the Elements as Instruments of the Soul (*De Anima* 2.4.415b18)." *Review of Metaphysics* 63, pp. 821-841.

Bosworth, A.B. 1980—. *A Historical Commentary on Arrian's History of Alexander*. Oxford: Clarendon Press.

Braun, T.F.R.G. 1982. "The Greeks in Egypt." *CAH*^{2}, vol. 2. Cambridge: Cambridge University Press, pp. 32-56.

Bretzl, H. 1903. *Botanische Forschungen des Alexanderzuges*. Leipzig: Teubner.

Briant, P. 2002. *From Cyrus to Alexander: A History of the Persian Empire*. P.T. Daniels, trans. Winona Lake, IN: Eisenbrauns.

Brockway, L. 1979. *Science and Colonial Expansion: The Role of the British Botanic Gardens*. New York: Academic Press.

Brockway, L. 1983. "Plant Imperialism." *History Today* 33:7, pp. 31-36.

Brown, T.S. 1949. *Onesicritus: A Study in Hellenistic Historiography.* Berkeley and Los Angeles: University of California Press.

Bukharin, M.D. 2012. "The Mediterranean World and Socotra," in I. Strauch, ed., *Foreign Sailors on Socotra: The inscriptions and drawings from the cave Hoq*. Bremen: Hempen, pp. 493-539.

Burstein, S.M. 1996. "Greek Contact with Egypt and the Levant, ca. 1600-500 B.C. An Overview." *The Ancient World* 27, pp. 20-28.

Byl, S. 1995. "L'aire géographique des médicins hippocratiques," in P. van der Eijk, H.F.J. Horstmanshoff, and P.H. Schrijvers, eds., *Ancient Medicine in its Socio-cultural Context.* Amsterdam: Rodopi, pp. 225-235.

CAH^{2} = I.E.S. Edwards *et al*., eds. 1970-2005. *The Cambridge Ancient History*, 2nd ed. Cambridge: Cambridge University Press.

Canter, H.V. 1938. "Praise of Italy in Classical Authors, I." *Classical Journal* 33:8, pp. 457-470.

Capelle, W. 1954. "Theophrast in Kyrene?" *Rheinisches Museum für Philologie* 97, pp. 169-189.

Carroll-Spillecke, M., ed. 1992a. *Der Garten von der Antike bis zum Mittelalter*. Mainz: Philipp von Zabern.

Carroll-Spillecke, M. 1992b. "Griechische Gärten," in Carroll-Spillecke 1992a, pp. 153-175.

Casson, L. 1986. "*P Vindob.* G 40822 and the Shipping of Goods from India." *Bulletin of the American Society of Papyrologists* 23, pp. 73-79.

Chantraine, P. 1999. *Dictionnaire étymologique de la langue greque*. Paris: Klincksieck.

Ciaraldi, M. 2005. "How many lives depended on plants? Specialisation and agricultural production at Pomeii," in A. MacMahon and J. Price, eds., *Roman Working Lives and Urban Living*. Oxford: Oxbow Books, pp. 191-201.

Ciaraldi, M. 2007. *People and Plants in Ancient Pompeii.* London: Accordia Research Institute.

Cole. S.G. 2010. " 'I Know the Number of the Sand and the Measure of the Sea': Geography and Difference in the Early Greek World," in Raaflaub and Talbert 2010, pp. 197-214.

Cole, T. 1999. *Democritus and the Sources of Greek Ethnography*. American Philological Association Monograph 25. Atlanta: Scholars Press.

Cook, I. and P. Crang. 1996. "The World on a Plate: Culinary Culture, Displacement and Geographical Knowledges." *Journal of Material Culture* 1:2, pp. 131-153.

D-K = Diels, H. and W. Kranz. 1934-1937. *Die Fragmente der Vorsokratiker*. Berlin: Weidmann.

Dalley, S. 2013. *The Mystery of the Hanging Garden of Babylon*. Oxford: Oxford University Press.

Dauster, M. 2000. "Roman Republican Sumptuary Legislation." *Studies in Latin Literature and Roman History* 11, pp. 65-93.

Dench, E. 2013. "The Scope of Ancient Ethnography," in Almagor and Skinner 2013, pp. 257-267.

Dihle, A. 1964. "The Conception of India in Hellenistic and Roman Literature." *Proceedings of the Cambridge Philological Association* 190, pp. 15-23.

Dueck, D. 2010. "The Geographical Narrative of Strabo of Amasia," in Raaflaub and Talbert 2010, pp. 236-251.

Edwards, C. 2003. "Incorporating the Alien: The Art of Conquest," in C. Edwards and G. Woolf, eds. 2003. *Rome the Cosmopolis*. Cambridge: Cambridge University Press, pp. 44-70.

Edwards, C. and G. Woolf. 2003. "Cosmopolis: Rome as World City," in C. Edwards and G. Woolf, eds. 2003. *Rome the Cosmopolis*. Cambridge: Cambridge University Press, pp. 1-20.

Elsner, J. 1991. "Cult and Sculpture: Sacrifice in the Ara Pacis Augustae." *Journal of Roman Studies* 81, pp. 50-61.

Erman A. and H. Grapow, eds. 1971. *Wörterbuch der ägyptischen Sprache*, 5 vols. with 2 supplements. Berlin: Akademie-Verlag.

Evans, R. 1999. "Ethnography's Freak Show: The Grotesques at the Edges of the Roman Earth." *Ramus* 28, pp. 54-73.

Fauth, W. 1977. "Der königliche Gärtner und Jäger im Paradeisos." *Persica* 8, pp. 1-53.

Fear, A. 2011. "The Roman's Burden," in Gibson and Morello 2011, pp. 21-34.

Filliozat, J. 1949. *La doctrine classique de la médicine indienne: ses origines et ses parallèles grecs*. Paris: Imprimerie Nationale.

Findly, E.B. 2008. *Plant Lives: Borderline Beings in Indian Traditions*. Delhi: Motilal Banarsidass.

Fortenbaugh, W.W. and R.W. Sharples, eds. 1988. *Theophrastean Studies: On Natural Science, Physics and Metaphysics, Ethics, Religion, and Rhetoric*. New Brunswick: Transaction.

Fraser, P.M. 1994. "The World of Theophrastus," in S. Hornblower, ed. *Greek Historiography*. Oxford: Clarendon Press, pp. 167-191.

French, R. and F. Greenaway, eds. 1986. *Science in the Early Roman Empire: Pliny the Elder, his Sources and Influence*. London: Croon Helm.

Gaiser, K. 1985. *Theophrast in Assos: zur Entwicklung der Naturwissenschaft zwischen Akademie und Peripatos*. Heidelberg: Carl Winter.

Gibson, K. and R. Morello, eds. 2011. *Pliny the Elder: Themes and Contexts*. Leiden: Brill.

Gotthelf, A. 1988. "*Historiae* I: *plantarum* et *animalium*," in Fortenbaugh and Sharples 1988, pp. 100-135.

Halbfass, W. 1988. *India and Europe: An Essay in Understanding*. Albany: State University of New York Press.

Hall, E. 1989. *Inventing the Barbarian: Greek Self-definition through Tragedy*. Oxford: Oxford University Press.

Hansen, O. 1986. "The Purported Letter of Darius to Gadates." *Rheinisches Museum für Philologie* 129, pp. 95-96.

Hanson, A.E. 1975. "Hippocrates: 'Diseases of Women 1'." *Signs* 1:2, pp. 567-584.

Harris, W.V. 2000. "Trade." *CAH*^{2}, vol. 11. Cambridge: Cambridge University Press, pp. 710-740.

Hartog, F. 1988. *The Mirror of Herodotus: the Representation of the Other in the Writing of History*. J. Lloyd, trans. Berkeley: University of California Press.

Haubold, J. 2013. *Greece and Mesopotamia: Dialogues in Literature*. Cambridge: Cambridge University Press.

Haussleiter, J. 1935. *Der Vegetarismus in der Antike*. Berlin: Alfred Töpelmann.

Hehn, V. 1902. *Kulturpflanzen und Hausthiere in ihrem Übergang aus Asien nach Griechenland und Italien*. Berlin: Gebrüder Borntraeger.

Hemmerdinger, B. 1968. "Noms communs grecs d'origine égyptienne." *Glotta* 46, pp. 238-247.

Hitchings, R. 2003. "People, plants and performance: on actor-network theory and the material pleasures of the private garden." *Social & Cultural Geography* 4:1, pp. 99-113.

Hughes, J.D. 1988. "Theophrastus as Ecologist," in Fortenbaugh and Sharples 1988, pp. 67-75.

Hughes, J.D. 2003. "Europe as Consumer of Exotic Biodiversity." *Landscape Research* 28:1, pp. 21-31.

Jacob, C. 1983. "De l'art de compiler à la fabrication du merveilleux. Sur la paradoxographie grecque." *Lalies* 5, pp. 121-140.

Jaeger, W. 1938. *Diokles von Karystos*. Berlin: De Gruyter.

Jouanna, J. 1999. *Hippocrates.* M.B. DeBevoise, trans. Baltimore: Johns Hopkins University Press.

Karttunen, K. 1989. *India in Early Greek Literature.* Helsinki: Studia Orientalia.

Karttunen, K. 1997. *India and the Hellenistic World*. Helsinki: Studia Orientalia.

Kawami, T.S. 1992. "Antike persische Gärten," in Carroll-Spillecke 1992a, pp. 81-99.

Kim, H.J. 2013. "The Invention of the 'Barbarian' in Late Sixth-Century BC Ionia," in Almagor and Skinner 2013, pp. 25-48.

Kosmin, P. 2013. "Apologetic Ethnography: Megasthenes' *Indica* and the Seleucid Elephant," in Almagor and Skinner 2013, pp. 97-116.

Kuhrt, A. 1995. *The Ancient Near East c. 3000-330 BC*, 2 vols. London: Routledge.

Kuhrt, A. 2001. "The Palace(s) of Babylon," in Nielsen 2001a, pp. 77-93.

Kuhrt, A. 2007. *The Persian Empire*, 2 vols. London: Routledge.

Lao, E. 2011. "Luxury and the Creation of a Good Consumer," in Gibson and Morello 2011, pp. 35-56.

Laufer, B. 1919. *Sino-Iranica: Chinese Contributions to the History of Civilization in Ancient Iran*. Chicago: Field Museum.

Lennox, J.G. 1985. "Theophrastus on the Limits of Teleology," in Fortenbaugh, W.W., Huby, P.M., and Long, A.A., eds. *Theophrastus of Eresus: On his Life and Work.* New Brunswick: Transaction Books, pp. 143-163.

Lloyd, A.B. 1975-88. *Herodotus Book II*, 3 vols. Leiden: Brill.

Lloyd, G.E.R. 1968. *Aristotle: The Growth and Structure of his Thought*. Cambridge: Cambridge University Press.

Lloyd, G.E.R. 1983. *Science, Folklore and Ideology: Studies in the Life Sciences in Ancient Greece*. Cambridge: Cambridge University Press.

Lloyd, G.E.R. 1984. "Hellenistic Science." *CAH*^{2}, vol. 7 pt. 1. Cambridge: Cambridge University Press, pp. 321-352.

Lonie, I.M. 1981. *The Hippocratic Treatises "On Generation" "The Nature of the Child" "Diseases IV."* Berlin: de Gruyter.

LSJ = Liddell, H.G., R. Scott, and H.S. Jones, eds. 1996. *A Greek-English Lexicon.* 9th ed. with revised supplement. Oxford: Clarendon Press.

Lumsden, S. 2001. "Power and Identity in the Neo-Assyrian World," in Nielsen 2001a, pp. 33-44.

Majno, G. 1991. *The Healing Hand: Man and Wound in the Ancient World*. Cambridge, MA: Harvard University Press.

Malkin, I. 2011. *A Small Greek World: Networks in the Ancient Mediterranean*. New York: Oxford University Press.

Mansvelt, J. 2005. *Geographies of Consumption*. London: Sage Publications.

Margueron, J.-C. 1992. "Die Gärten in Vorderen Orient," in Carroll-Spillecke 1992a, pp. 45-80.

Mayer, E. 2012. *The Ancient Middle Classes: Urban Life and Aesthetics in the Roman Empire, 100 BCE-250 CE*. Cambridge, MA: Harvard University Press.

McCracken, D.P. 1997. *Gardens of Empire: Botanical Institutions of the Victorian British Empire*. London: Leicester University Press.

McCrindle, J.W. 1901. *Ancient India as Described in Classical Literature*. Westminster: Archibald.

Meiggs, R. 1982. *Trees and Timber in the Ancient Mediterranean World*. Oxford: Clarendon Press.

Miller, J.I. 1969. *The Spice Trade of the Roman Empire 29 BC to AD 629*. Oxford: Clarendon Press.

Minkowski, C. 2010. "Where the Black Antelope Roam: Dharma and Human Geography in India," in Raaflaub and Talbert 2010, pp. 9-31.

Möller, A. 2001. "Naukratis — griechisches *emporion* und ägyptischer ‚port of trade'," in U. Höckmann and D. Kreikenbom, eds. *Naukratis: die Beziehungen zu Ostgriechenland, Ägypten und Zypern in archaischer Zeit*. Möhnesee: Bibliopolis, pp. 1-25.

Morley, N. 2007. *Trade in Classical Antiquity*. Cambridge: Cambridge University Press.

Morton, A.G. 1986. "Pliny on Plants: His Place in the History of Botany," in French and Greenaway 1986, pp. 86-97.

Moyer, I. 2011. *Egypt and the Limits of Hellenism*. Cambridge: Cambridge University Press.

Moynihan, E.B. 1979. *Paradise as a Garden in Persian and Mughal India*. New York: George Braziller.

Murphy, D. 2005. "Aristotle on Why Plants Cannot Perceive." *Oxford Studies in Ancient Philosophy* 29, pp. 295-339.

Murray, O. 1972. "Herodotus and Hellenistic Culture." *Classical Quarterly* 22:2, pp. 200-213.

Murray, O. and M. Stern. 1973. "Hecataeus of Abdera and Theophrastus on Jews and Egyptians." *Journal of Egyptian Archaeology* 59, pp. 159-168.

Naas, V. 2011. "Imperialism, *Mirabilia*, and Knowledge: Some Paradoxes in the *Naturalis Historia,*" in Gibson and Morello 2011, pp. 57-70.

Narayanan, V. 1997. " 'One Tree is Equal to Ten Sons': Hindu Responses to the Problems of Ecology, Population, and Consumption." *Journal of the American Academy of Religion* 65:2, pp. 291-332.

Nielsen, I., ed. 2001a. *The Royal Palace Institution in the First Millenium BC: Regional Development and Cultural Interchange between East and West.* Athens: Danish Institute.

Nielsen, I. 2001b. "The Gardens of the Hellenistic Palaces," in Nielsen 2001a, pp. 165-187.

Norden, E. 1922. *Die germanische Urgeschichte in Tacitus Germania.* Leipzig: Teubner.

Obbink, D. 1988. "The Origin of Greek Sacrifice: Theophrastus on Religion and Cultural History," in Fortenbaugh and Sharples 1988, pp.272-295.

Obbink D. Forthcoming. "Two New Poems of Sappho." *Zeitschrift für Papyrologie und Epigraphik* 189.

OGIS = Dittenberger, W. 1903-1905. *Orientis Graeci Inscriptiones Selectae*. Leipzig: S. Hirzel

Parker, G.R. 2008. *The Making of Roman India*. Cambridge: Cambridge University Press.

Pearson, L. 1960. *The Lost Histories of Alexander the Great*. New York: American Philological Association.

Pédech, P. 1984. *Historiens compagnons d'Alexandre*. Paris: Belles Lettres.

Plofker, K. 2010. "Humans, Demons, Gods and Their Worlds: The Sacred and Scientific Cosmologies of India," in Raaflaub and Talbert 2010, pp. 32-42.

Pollock, S. 2006. *The Language of the Gods in the World of Men: Sanskrit, Culture, and Power in Premodern India*. Berkeley: University of California Press.

Prance, G. and M. Nesbitt, eds. 2005. *The Cultural History of Plants*. New York: Routledge.

Purcell, N. 2000. "Rome and Italy." *CAH*^{2}, vol. 11. Cambridge: Cambridge University Press, pp. 405-443.

Raaflaub, K.A. and R.J.A. Talbert, eds. 2010. *Geography and Ethnography: Perceptions of the World in Pre-modern Societies*. Chichester: Wiley-Blackwell.

Rawlinson, H.G. 1916. *Intercourse between India and the Western World from the Earliest Times to the Fall of Rome*. Cambridge: Cambridge University Press.

Reade, J. 2000. "Alexander the Great and the Hanging Gardens of Babylon." *Iraq* 62, pp. 195-217.

Romm, J. 1989. "Aristotle's Elephant and the Myth of Alexander's Scientific Patronage." *American Journal of Philology* 110:4, pp. 566-575.

Romm, J. 1992. *The Edges of the Earth in Ancient Thought.* Princeton: Princeton University Press.

Romm, J. 2010. "Continents, Climates, and Cultures: Greek Theories of Global Structure," in Raaflaub and Talbert 2010, pp. 215-235.

Rosellini, M and S. Saïd. 1978. "Usages de femmes et autres *nomoi* chez les 'sauvages' d'Hérodote: Essai de lecture structurale." *Annali della Scuola normale superiore di Pisa, Classe di lettere e filosofia* 3:8, pp. 949-1005.

Rostovtzeff, M. 1941. *The Social and Economic History of the Hellenistic World*, 3 vols. Oxford: Clarendon Press.

Rottenberg, A. and D. Zohary. 1996. "The wild ancestry of the cultivated artichoke," *Genetic Resources and Crop Evolution* 43:1, pp. 53-58.

Scarborough, J. 1978. "Theophrastus of Eresus on Herbals and Herbal Remedies." *Journal of the History of Biology* 11:2, pp. 353-385.

Schäfer, J. 1992. "Gärten in der bronzezeitlichen ägäischen Kultur?" in Carroll-Spillecke 1992a, pp. 101-140.

Schepens G. and K. Delcroix. 1996. "Ancient Paradoxography: Origin, Evolution, Production and Reception," in O. Pecere, ed., *La letteratura di consumo nel mondo greco-latino*, pp. 373-460.

Schiebinger, L. 2004. *Plants and Empire: Colonial Bioprospecting in the Atlantic World*. Cambridge, MA: Harvard University Press.

Schmithausen, L. 1991. *The Problem of the Sentience of Plants in Earliest Buddhism*. Tokyo: International Institute for Buddhist Studies.

Sedlar, J.W. 1980. *India and the Greek World*. Totowa, NJ: Rowman and Littlefield.

Seland, E.H. 2007. "Ports, Ptolemy, *Periplus* and Poetry—Romans in Tamil South India and on the Bay of Bengal," in E.H. Seland, ed. *The Indian Ocean in the Ancient Period: Definite Places, Translocal Exchange*. Oxford: Archaeopress, pp. 69-82.

Senn, G. 1956. *Die Pflanzenkunde des Theophrast von Eresos: seine Schrift über die Unterscheidungsmerkmale der Pflanzen und seine Kunstprosa*. Basel.

Sharples, R.W. 1988. "Some Aspects of the Secondary Tradition of Theophrastus' *Opuscula*," in Fortenbaugh and Sharples 1988, pp. 41-64.

Sharples, R.W. 1995. *Theophrastus of Eresus: Sources for his Life, Writings, Thought and Influence*, vol. 5, *Sources on Biology*. Leiden: Brill.

Sherwin-White, S.M. and A. Kuhrt. 1993. *From Samarkhand to Sardis: A New Approach to the Seleucid Empire*. Berkeley: University of California Press.

SIG^{3} = Dittenberger, W., ed. 1915-1924. *Sylloge Inscriptionum Graecarum*. Leipzig: S. Hirzel.

Skinner, J.E. 2012. *The Invention of Greek Ethnography: from Homer to Herodotus*. Oxford: Oxford University Press.

Smith, E.M. 1926. "Naukratis, A Chapter in the History of the Hellenization of Egypt." *Journal of the Society of Oriental Research* 10:2, pp. 119-206.

Sollenberger, M.G. 1988. "Identification of Titles of Botanical Works of Theophrastus," in Fortenbaugh and Sharples 1988, pp. 14-24.

Sorabji, R. 1993. *Animal Minds and Human Morals: The Origins of the Western Debate*. Ithaca, NY: Cornell University Press.

Sprague, R.K. 1991. "Plants as Aristotelian Substances." *Illinois Classical Studies* 16, pp. 221-229.

Strömberg, R. 1940. *Griechische Pflanzennamen*. Göteborg: Elanders boktryckeri aktiebolag.

Stronach, D. 1989. "The Royal Garden at Pasargadae: Evolution and Legacy," in L. De Meyer and E. Haerinck, eds., *Archaeologica Iranica et Orientalis*. Ghent: Peeters, pp. 475-502.

Stronach, D. 1990. "The Garden as a Political Statement: Some Case Studies from the Near East in the First Millenium B.C." *Bulletin of the Asia Institute* 4, pp. 171-180.

Stronach, D. 2001. "From Cyrus to Darius: Notes on Art and Archaeology in Early Achaemenid Palaces," in Nielsen 2001a, pp. 95-111.

Tarn, W.W. 1951. *The Greeks in Bactria and India*, 2nd ed. Cambridge: Cambridge University Press.

Thomas, R. 2000. *Herodotus in Context: Ethnography, Science, and the Art of Persuasion.* Cambridge: Cambridge University Press.

Thomas, R.F. 1982. *Lands and Peoples in Roman Poetry: the Ethnographical Tradition.* Cambridge Philological Society Supplement 7. Cambridge: Cambridge University Press.

Tomber, R. 2008. *Indo-Roman Trade: From Pots to Pepper.* London: Duckworth.

Trüdinger, K. 1918. *Studien zur Geschichte der griechisch-römischen Ethnographie*. Diss. Basel.

Vallance, J. 1988. "Theophrastus and the Study of the Intractable: Scientific Method in *De lapidibus* and *De igne*," in Fortenbaugh and Sharples 1988, pp. 25-40.

Vlassopoulos, K. 2013a. *Greeks and Barbarians*. Cambridge: Cambridge University Press.

Vlassopoulos, K. 2013b. "The Stories of Others: Storytelling and Intercultural Communication in the Herodotean Mediterranean," in Almagor and Skinner 2013, pp. 49-76.

Wallace-Hadrill, A. 2008. *Rome's Cultural Revolution*. Cambridge: Cambridge University Press.

Wardy, R. 2005. "The Mysterious Aristotelian Olive." *Science in Context* 18:1, pp. 69-91.

Warmington, E.H. 1928. *The Commerce between the Roman Empire and India*. Cambridge: Cambridge University Press.

WäS = Erman and Grapow 1971.

Wiesehöfer, J. 1987. "Zur Frage der Echtheit des Dareios-Briefes an Gadatas." *Rheinisches Museum für Philologie* 130, pp. 396-398.

Wiseman, D.J. 1952. "A new Stela of Aššur-naṣir-pal II." *Iraq* 14:1, pp. 24-44.

Wöhrle, G. 1985. *Theophrasts Methode in seinen botanischen Schriften*. Amsterdam: Grüner.

Wöhrle, G. 1988. "The Structure and Function of Theophrastus' Treatise *De odoribus*," in Fortenbaugh and Sharples 1988, pp. 3-13.

Woolf, G. 2011. *Tales of the Barbarians: Ethnography and Empire in the Roman West*. Chichester: Wiley-Blackwell.

Zanker, P. 1990. *The Power of Images in the Age of Augustus*. A. Shapiro, trans. Ann Arbor: University of Michigan Press.

Zisis, B.G. 1954. “Βαμβακερά, καννάβινα καὶ λινᾶ ὑφάσματα τοῦ 5ου π.Χ. αἰῶνος. Ἀποδίπλωσις και συντήρησις αὐτῶν.” Praktika tes Akademias Athenon 29, pp. 587-593.