No Mere Mouthpiece
An Examination of the Hesiodic Farmer

by

Richard J. P. Kavadas
B.F.A. University of Victoria, 2000
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Supervisory Committee

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Abstract

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Examines the character construction of the Hesiodic ‘farmer’ in the scholarship of *Works and Days*. Questions Hesiod’s intimacy of agricultural knowledge: was he a practical farmer or a non-farming poet? Using my farming experience I question the adequacy of the information in *Works and Days* for use as a farming manual. Lines 635-640 - Hesiod’s description of the climatic conditions of Ascra in respect to farming are set against soil properties (soil biochemistry as an evaluating tool) and agricultural responses (farming methods of other cultures) shows Hesiod to have little grasp of the farming methods each situation requires. Text comparatives: *Fan Shêng-Chih Shu* an ancient Chinese agricultural text detailed with attention to soil fertility. Supporting ancient texts: Cato on *Agriculture*, Columella on *Agriculture*, Theophrastus on *Plants*, Xenophon *Oeconomics* and Homer’s *Odyssey* for references to dung and soil fertility. The vague farming information suggests a non-personalized experience - the Hesiodic ‘farmer’ is probably not a practical farmer at all.

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Acknowledgments

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Further, I acknowledge the farmers, retired and active, who taught me the art of farming.

Dedication

I dedicate this thesis to the person who endured endless hours of conversations about ploughs, soils, microbes, oral knowledge, crops, social-politics of the ancient world and manure, and still greets me with a smile - Danielle, my wife.

I further dedicate this thesis to my daughters Jasamine and Alexandra for their patience, encouragement and support, and to my father Alexander Kavadas and my grandfather Dimitrios Kavadas who taught me how to ‘see’ the plant world and its role in the human experience.

Introduction

While the poet Hesiod writes about the practice of farming in *Works and Days* and portrays himself as a farmer, I will present evidence to demonstrate why I believe that Hesiod was not a farmer. I will approach the poem from personal farming experience, and through the lens of my personal history in farming I will critique Hesiod's *Works and Days*. My main focus will be on Hesiod's description of the climate where he was supposedly farming and what those climatic conditions mean in relation to farming. I will also examine the level of information Hesiod provides on farming. By 'level of information' I mean a level of knowledge, which reflects the depth of the information provided, suggesting either a closeness, i.e., firsthand experience or a distancing, i.e., secondhand information or observational reporting. I suggest that there are two sources of agricultural knowledge: a personalized or private understanding of farming as opposed to a public or community understanding of farming. I question whether Hesiod offers a personalized level of farming information, which would indicate personal experiences in farming and suggest that he is a true farmer, or whether he offers a more generalized level of information on farming, suggesting that his source on farming lore is from common knowledge held in the

community, suggesting Hesiod was not necessarily a farmer. I further ask if Hesiod's description of the climatic conditions are taken at face value, then what personal events, actions, responses, has Hesiod taken; thereby demonstrating or offering 'signatures' of a personalized history in farming in the climate he describes.

I propose to view *Works and Days* through the eyes of a farmer. I understand the danger of assuming that the ancient Greek farmer would and could share a similar viewpoint as a farmer in the modern world. I would, however, point out that agricultural knowledge is not something that can be gained from simple observation or understood fully without entering into the practice of farming. The art of farming is a learned skill that involves a level of personalized understanding of methodologies and rationale employed in the process of crop production. I will apply the practical knowledge taught to me by older and often retired farmers while critiquing *Works and Days*. Many of my teachers were pioneers (novice farmers) who settled and farmed the prairies from the late 1880's onward. Their knowledge of farming was drawn from personal histories of successful and failed experiences with crop production from year to year. The 'on the farm' solutions to various crop and livestock demands varied from farmer to farmer in relationship to each particular situation. Each farmer I learned from had his or her own way of teaching, but each shared the same tendency to reference his or her own experiences as a teaching tool and as a source of knowledge. I will be searching for information within *Works and*

Days which reflects this sense of personalized history or intimate level of knowledge of farming.

The evidence I present will support the concept that there are two levels of agricultural understanding, one private – a personalized practical farming knowledge particular to a localized attention; the other public – generalized observations applicable beyond the localized area. I will draw attention to what is mentioned and what is not in Hesiod's list of 'actions' a farmer must follow to be successful. I will bring attention to the role of the soil as the medium a farmer must learn to 'read' or understand for successful farming and question Hesiod's lack of attention to his soil condition. The condition of the soil was the main concern for most of the farmers I learned from, and understanding how to respond to various soil conditions is the difference between successful farming and failure, according to what I was taught. I will also introduce modern soil sciences to underline a few simple principles of the growing medium, the soil, expressed as concepts of inputs and outputs, nutrient cycle, etc., to establish a basic understanding of the soil as a growing medium with real-life limitations that cannot be ignored by the farmer. I will suggest that understanding the soil/plant relationship is a benchmark to highlight the role a farmer plays in observing the relationship between crop growth and the soil.

There will be many questions raised which I will only briefly address and at times the questions that arise will be footnotes rather than part of the body of the discussion. I will be drawing from other agrarian societies and from different time periods only to explore issues that arise in *Works and Days*. I will use

comparisons to contrast the similarities or the divergent differences of other agricultural texts drawing attention to the focus of authors of agricultural writings. An analysis of the information in *Works and Days* on how practical the information on farming is and whether that information is precise or general is explored. A general survey of Hesiodic scholarly works is presented first to address the current state of Hesiodic research. I follow my course of exploration and thoughts while examining the current and past scholarly research on Hesiod's *Works and Days*. I will challenge many points-of-view presented in the current scholarly work on *Works and Days* and expand the discussion throughout two chapters.

Scholarly Review

Victor Davis Hanson,[1] a farmer and classical scholar, seemed to be a reasonable point to begin my research. Hanson applies his own experiences in farming to his understanding of Hesiod's *Works and Days* much as I will be doing. Hanson uses his own experiences in farming as examples in interpreting or verifying similar farming activities and behaviors found in the ancient literature, as in Hesiod's poem, associated with the rise of the agrarian Greek society. He employs anecdotal comments to support the notion of agricultural 'truths' being revealed in the ancient literature. Hanson also promotes the idea that more than

[1] Victor Davis Hanson, *The Other Greeks: The Family Farm and the Agrarian Roots of Western Civilization* (New York: The Free Press, 1995).

simple agricultural knowledge is being relayed through the ancient literature and contends that there is a social shift of activities and focus related to the changes brought about through the community engaging in farming. For example, the basic premise Hanson has put forth is encapsulated in the following statement:

> This conjecture of the appearance of a "new man," in addition to a novel type of farming and the creation of private ownership of property, is confirmed when we look …at another piece of literature, the *Works and Days* – an oral poem of Hesiod's composed about the same time as the *Odyssey*, but one drawn from a completely different social environment, where farmers are essential to the narrative of the poem itself, not incidental. (Hanson 88-89)

The position Hanson takes then is that there is an evolution, taking place, within the sense of community and the rise of individualism, which has a direct relationship with farming and farmers as demonstrated in *Works and Days*. From this standpoint Hanson delivers a mixture of common or practical farming sense, which I certainly can identify with and understand the significance to good farming practices, but I am not wholly convinced *Works and Days* provides an insightful level of knowledge. Rather, it appears that Hanson has instilled his own perspicacity on what is farming into his analysis of *Works and Days* or the other ancient texts he refers to such as Homer's *Odyssey*.

Hanson uses passages of the *Odyssey* to draw examples from to support his argument. For example, Hanson concentrates on Laertes' farm (Odysseus's father), describing a farm built up from his (Hanson's) research and his personal knowledge of farming. While I question the value of imposing a localized modern view on farming as Hanson appears to do to the particulars of *Works and Days*

or the *Odyssey*, the exploration of what is stated within the texts when compared to actual farming experiences is a fruitful avenue to explore. Hanson is careful to make note that the *Odyssey* "is a literary document…it is not history" (Hanson 49), clearly indicating a description of a farm emerging from the Dark Age - a conclusion arrived at through other sources.[2] Hanson draws on the later literary sources such as Theophrastus (320-280 B.C.E.), a student of Aristotle, who composed a series of books on the nature of plants that reference farming throughout, as his evidence for a "new creed practiced by those outside the traditional Dark Age ruling elite" (Hanson 94). In Hanson's view, Hesiod has composed "an almanac of a rural society at peace" that depicts "structures of intensive farming" in a systematic way not present in Homer's works (Hanson 95). I will question Hanson's notion that Hesiod is reflecting "a new creed" in effect an agricultural revolution within his society and whether Hesiod is actually relaying agricultural knowledge of value to a farmer, particularly a novice farmer. Hanson wants there to be 'truths' within *Works and Days* as he states, "Keep in mind that Hesiod's poem is not fiction," but then adds "at least not entirely" (Hanson 95).

I contend that Hesiod's poem is fiction. The character of 'Hesiod the farmer' is a construct, a believable persona yet fictional none the less. Though Hanson's research is thorough, and insightful, it still reads into *Works and Days* things that simply are not present, such as a relationship between hoplites

[2] Hanson, 49. "It most likely reflects modes of farming contemporary with Homer's own life – that is, the era roughly around 700 B.C." Hanson indicates the following chronology: Mycenean (1600 –1150 B.C.E.), Dark Age (1000 –750 B.C.E.), and early Archaic (750 –700 B.C.E.) (49).

(ancient Greek warrior soldiers) and farmers and warfare in general. Granted, Hesiod does mention warring as part of the unjust community, "again, at another time, the son of Cronos either destroys their wide army, or their walls, or else makes an end of their ships on the sea" (*Works and Days* 240-245). For Hesiod there is a failing within the community that goes to war, war is not something that is desired or the norm; it is a punitive act of Zeus, but it is also something that he relegates to the past (the Heroic Age).[3]

For purposes of this thesis I will be asking of *Works and Days* how practical is the information on farming and whether that information is there to support the character of 'Hesiod the farmer' by creating an environment and place which establishes a virtual presence to the character. Hanson entertains the idea that Hesiod "was probably…a farmer" that his dispute with Perses was a "real dispute" and that "Hesiod gives practical advice" and that his point of view on competition is likened to Adam Smith's philosophy of free-market economies, which is perhaps transporting the American mythos of rugged individualism into *Works and Days* (Hanson 95-99). In effect, Hanson has interpreted *Works and Days* according to his own cultural understanding of farming, something I realize I need to be aware of and acknowledge, while recognizing that Hesiod also is subject to the same premise: the perception of what farming is and how to

[3] *Hesiod, the Homeric hymns, and Homerica*, trans. Hugh G. Evelyn-White (London: W. Heinemann, 1914) (translation used throughout the thesis unless otherwise indicated) *Works and Days* 110 – 169. Hesiod's ages of man from the golden race to the iron race (his age), the fourth age which "grim war and dread battle destroyed part of them"(160 -165) is the Heroic age or the age of the Homeric epics. Hesiod therefore appears to assign war as a past event by placing it in an age gone-by.

accomplish it is culturally defined, with personalized aspects governed by the universality of agriculture.[4]

Hanson references A.M. Snodgrass, whose research into the Dark Age and the emergence of the Greek *polis* is explored in the text *The Dark Age of Greece.*[5] This work offers a window into the world surrounding the Hesiodic world of *Works and Days* generated from the archaeological, epigraphical and textual evidence Snodgrass uses. Snodgrass takes the stance that Hesiod "is an arable farmer through and through," despite his lack of attention to his soil fertility, "and instructs his audience from the basic principles onwards" (Snodgrass 379). My research challenges the premise that Hesiod is providing instructions on farming from the basics to the more detailed nuances. Snodgrass suggests there is an emergence taking place, giving reason for the low level of information provided, in which the past heroic world of Homer's epics is giving way to a revolution in agriculture, brought on by a newly learned or discovered agricultural methodology which is so new the description of it is lacking.

Snodgrass notes, "Greece in the historical period, with much of the Mediterranean world, did increasingly adopt arable farming, and a grain-based diet" (Snodgrass 379). In short Snodgrass contends that "Hesiod's advocacy suggests that in about 700 BC Greeks still needed exhortation and elementary

[4] What I am referring to when I suggest the term 'universality of agriculture' is the basic understanding that there are seasons and activities that occur within those seasons that are particular to farming such as ploughing, seeding and harvesting.

[5] A.M. Snodgrass, *The Dark Age of Greece* (Edinburgh: Edinburgh University Press, 1971)

instruction in arable-farming" (Snodgrass 379). There is an assumption being made that Hesiod provides information on arable farming but at an elementary level. Snodgrass takes the position that Hesiod is a farmer and that the information he divulges is about a relatively new technological change – arable farming.[6] I will touch briefly on the problems with this position such as the specialization of labour depicted by Hesiod in the construction of the plough. Snodgrass notes that iron is not mentioned for the plough share and that Hesiod's lack of mentioning the metal share evokes the following conclusion, "the existence – as in the Late Bronze Age – of metal hoes, picks and plough-shoes would normally be doubted, but for the fact that Hesiod's prescription for making a plough, centuries later, seems not to include a metallic share" (Snodgrass 378). Therefore, the conclusion is that indeed there were no metal fixings on agricultural tools. Yet, this perspective assumes that Hesiod is relaying an accurate description of the construction of a plough, in which it should be noted that he includes a specialized craftsman with skills that a farmer must outsource.

The outsourcing of labour indicates a set of skills and knowledge that is not shared by the farmers; they rely on the skilled craftsman to accomplish the task of constructing a portion of a plough, at least in the depiction that Hesiod has created as he draws attention to off the farm work, "when one of Athena's

[6]Snodgrass, *Archaic Greece*: *The Age of Experiment* (London: JM Dent & Sons Ltd, 1980), 36. "It is a poetic manual of arable farming which shows awareness of its wider economic context and social implications, yet reverts to a fairly rudimentary level of instruction in husbandry – a combination which suggests an uneven spread of experience, and thus a moment when the decisive concentration on arable farming was in the very process of diffusion across Greece."

hand-men has fixed in the share-beam and fastened it to the pole with dowels" (*Works and Days* 425-430). So farming has been an activity undertaken long enough in Hesiod's community to establish specialized occupations such as "Athena's hand-men" or a blacksmith. This casts doubt on Snodgrass's suggestion that agriculture was rudimentary in 700 B.C.E. Snodgrass, like Hanson, is more interested in the Dark Age through Hesiod's glimpse of that world in a state of change. This thesis views the level of information on farming and how it is arranged as more significant than whether or not it depicts an accurate image of the emerging Greek communities evolving from Dark Age settlements into a particular community form known as the *polis*.

The process Snodgrass points to for such change is a social and economic evolution[7] "of a more material or structural kind" that "established the economic basis of Greek society, as well as the main outlines of its social framework" (Snodgrass 1980, 13). There is an assumption that arable farming was part of the evolution, and that arable farming was a new technology that altered the economic outlook. The newness of the technology is supposedly evident in Hesiod's rudimentary depictions of farming practices. I shall interpret the lack of sophisticated information in a different way, which will suggest an alternative analysis of the rudimentary level of the information provided.

To understand the economic impact and arrangements I turned to M.I. Finley, reviewing *The Ancient Economy* (1973) and *Economy and Society in Ancient Greece* (1981), particularly for references to the Hesiodic world. Finley

[7] Snodgrass, *Archaic Greece: The Age of Experiment* explores the notion of a technological change, i.e., arable farming, as a catalyst of social change.

places Hesiod in the role of a possible outsider of the elite sphere of influence, "Hesiod, of all ancient writers, was no mere mouthpiece for upper-class values" (Finley 1973, 39). This claim is based solely on the notion that Hesiod is composing a working farmer's poem on agriculture and the emerging new economics that facilitates the creation of the *polis*. Indeed, Finley quotes Strabo, a geographer of Roman times, noting that once people have been "converted (or compelled) to a peaceful, settled agricultural existence, urbanism will develop, and they will become civilized" (Finley 1973, 123). This sentiment is well established in the *Odyssey*, composed by Homer around the same time as Hesiod's *Works and Days*, as Odysseus (protagonist) describes an island off the coast of the Cyclopes' land[8] in terms of a settler or colonist viewing the land as ready to be brought under farming and developed to form a community. Though Finley provides a rather sweeping analysis that covers a vast time frame, the focus is more on Roman economics[9]. As a consequence there is very little available to my research purposes directly. However, Finley does provide a definition of his focus:

> What I have been attempting to do is to pinpoint the ancient "investment" concept, to define its character and its limits in both ideology and practice. Ancient writers -– we must never allow ourselves to forget – did not describe land as the best investment in maximization of income language; it was profitable, to be sure, if held on a large enough scale, but they ranked it first at least as much on grounds of "nature" and morality, and they had not yet learned to draw simple one-for-one equation between morality and profits. (1973, 121-122)

[8] Homer *Odyssey* IX 115-125.

[9] Finley's *Economy and Society in Ancient Greece* is focused on the ancient Greek economy, and offers a more Greek focus.

Finley does create a picture of the economic situation plausible for Hesiod's time and in doing so references Hesiod. He does not, however, delve into analyzing Hesiod's self-presentation, but rather proposes differing scenarios for the possible social structure surrounding Hesiod. Finley seems to accept Hesiod's *Works and Days* as a window into the 700 B.C.E. world of ancient Greece and that Hesiod is a farmer. I question the notion that the Hesiod of *Works and Days* is a farmer and later I will deconstruct this Hesiod (the Hesiodic farmer) in the course of the argument to demonstrate why I disagree with Finley and other scholars.

To complement Finley's research which tends to be more Rome-centric, I turned to Nicholas F. Jones' research which is Greek-centric. *Ancient Greece* (1996) is more of a textbook style of a series of discussions focused around Athenian history and offers a chronological journey through early Greek history - the Minoan and Mycenaean ages and on through to the Hellenistic age. Jones' 2004 published research *Rural Athens Under the Democracy* furthers his study of the Athenian state and offers a closer look at Athenian history. Both works provide an image of the farmer in the ancient world, but that image is drawn from ancient Athenian sources and the corresponding archaeological evidence, and particularly not drawn from Boeotian evidence of which there is very little. Hesiod's *Works and Days* is the literary source for that time period (700 B.C.E.). However, Jones incorporates Hesiod's *Works and Days* in his research, despite its not being Athenian, and views *Works and Days* as a poem created "to impart information, advice and wisdom pertaining to agriculture (and seafaring)

practiced at the level of the individual household" (Jones 2004, 48). In recognition of the problem of the rudimentary level of the information in *Works and Days* Jones states, "Hesiod does not address his advice to rank neophyte untutored in even the most fundamental of agriculture (or maritime) practices, but rather to the listener or reader already versed in the basics but who must also command the nuances, niceties, and fine distinctions of selection, quantity, scale, and especially timing if he is to succeed" (Jones 2004, 49-50).

Jones awards a level of authority to Hesiod's *Works and Days* by stating, "attention to Hesiod's admonitions, that is, can make or break the householder operating on the cusp that separates a self-sufficient general prosperity from ruin" (Jones 2004, 50). This would be true if Hesiod's information contains substantial context that is directly related to farming (seafaring) success. Jones believes "Hesiod imparts in the *Works* a vast quantity of advice and information concerning the proper (and profitable) management of a small farm (as well as a shorter account of good navigational technique)" (Jones 1996, 50). Jones's argument is contrary to Snodgrass's thesis, at least in the level of competence of the (farmer) audience and of the information provided. Both opinions can be challenged successfully, and this will clear the way for a different analysis of *Works and Days*.

The world Hesiod creates in his poem appears to be similar to the world of 700 B.C.E. understood through scholarly research. The modern image of Hesiod's world has been created from evidence derived from external sources, by which I mean sources removed from the local region of Hesiod's world.

However, as modern archaeology reinterprets and uncovers more evidence, the compatibility of *Works and Days* and the cultural material evidence may become strained challenging the image of 'farmer' presented by Hesiod and assumed by scholars.

The question then becomes: in what way has recent scholarship modified the definition of a farmer? In order to answer this question I decided that I needed to establish a set of criteria by which I could define farmer. This task was undertaken with studies in Environmental Sciences over-seen by Dr. Paul West, of the University of Victoria, a chemist and environmental scientist. I engaged in a survey of the history of agriculture, examining the evidence and research from the Northern European Neolithic sites to modern day practices of Western agribusiness. I examined the definitions and terminology applied to describe a wide range of agricultural practices and philosophical perspectives from several time periods and cultures.[10] What I discovered was a tendency of the educated elite to infer what farmers were doing, but very little material that reflected a farmer's point of view. A pattern seemed to take shape, suggesting that the source of the definitions and terminology describing farmers and farming were not the indigenous farmers, but rather non-farmers such as scholars. I mean by

[10] Early European agriculture, ancient Mayan, North American indigenous agriculture (Huron), the settling of North America, adoptive agriculture – Indian reserve agriculture of the 1800's, ancient Chinese, 1950's Green Revolution in Africa, Western Agribusiness, modern Bangladesh and the re-emergence of traditional agriculture, and present state of recaptured indigenous agriculture. Philosophical perspectives and issues reviewed include: feminism, deep ecology movement, sustainability, cultural landscape, biodiversity, agroecosystems, ecology, agrolandscapes, biotechnology, risk aversion, ploughing – biological activity; impact on protozoan diversity and activity, organic matter, nutrient cycles, fertilization, industrial agriculture, monocultures, mixed farming, latitude and soil fauna diversity (rhizosphere), legumes – nitrogen fixation, farmer vs. scientist cultivar selection methods, inter cropping, soil disturbance, polyculture, anthropocentric ecological view, socio-economics, and political-economy.

this that the farmers were not supplying the lexicon in which the farmers defined their practices; those definitions tended to come from outside of the farming community.[11] Even modern attempts to remedy this perhaps result in repeating the same 'error' by designating definitions and terms (labeling) to note the flow of knowledge as a stream of values with a hierarchical preference taking place within the predilection of the scholar who ultimately controls the language applied. A recent study[12] in the Netherlands which brought dairy farmers and scientists together suggests that the definitions and terms applied to agriculture do not necessarily reflect the farmer's experiences,[13] they do however, perhaps reflect the scholars' perceived values. The inability to establish a value for the practitioners' own definitions and terminology[14] signals perhaps a difference in perception of what is farming, suggesting a different understanding of the role of the farmer in farming.

[11] Gitta Roth. "The position of farmer's local knowledge within agriculture extension, research, and development cooperation," *Knowledge and Development Monitor* Volume 9 Issue 3 (November 2001), 10. "The introduction of the farmer-first (FF) approach in the late 1980's represented a reversal for agricultural research and extension bodies. The starting point of development was now an active and equitable partnership between rural people, researchers and extensionists."

[12] Jasper Eshuis and Marian Stuiver, "Learning in context through conflict and alignment: Farmers and scientists in search of sustainable agriculture," *Agriculture and Human Values* 22 (2005): 137–148. 137 "This article analyzes learning in context through the prism of a sustainable dairy-farming project… differences between heterogeneous forms of farmers' knowledge and scientific knowledge were discursively constructed during conflict and subsequent alignment over the validity and relevance of knowledge."

[13] Roth, 11. "Participatory research and development concepts….encourage farmers to generate and evaluate indigenous technologies on the basis of their own knowledge and value system." Recent research in rural studies recognises that the localised knowledge (indigenous) has its own value system and lexicon of meanings resident with the local farmers on an individual by individual biases.

[14] Roth, 10. "Indigenous knowledge is seen as the cultural knowledge of a rural people, promoting understanding and identity among members of a farming community, where local technical knowledge and skills are inextricably linked to non-technical issues."

The question becomes one of finding a common element that allows a bridging of the two streams of knowledge; practical farming knowledge and scientific understanding. To answer this question I determined that I needed to establish a primary discourse on the medium the farmer grows his or her crops on - the soil. I turned to Dr. Real Roy, at the University of Victoria, to guide me in understanding the complexity of the soil biosphere. I contended that by understanding the characteristics of the soil, a set of potential limitations in which to evaluate the viability of cropping on any one particular soil could be developed and tested against Hesiod's farming advice and the notions of some scholars. Soil testing was an aid used on the farms where I worked to help determine the nutrient levels of the soil and what application rates of fertilizer to apply, if required. My experience in farming has taught me that attention to the soil is a primary requirement for successful farming. I contend that a better understanding of the role of the nutrients in the soil and how they become available to plant life offers a challenge to Hesiod's farming advice and highlights the absence of his attention to the soil. Although my grasp of the soil sciences is rudimentary, the basic information on nutrients of the soil is something I understand better through my farming experiences than in scientific terms. I will apply both approaches to understanding the role of soil nutrients in plant growth.

It became clear to me that I needed to gather scholarly work more directly related to Hesiod's poem rather than solely addressing what the Greek world was like in the time of Hesiod's poem 700 B.C.E. Armed with a more critical perspective, I gathered scholarly works more directly related to Hesiod's poem

Works and Days. M. L. West's research seemed to be the most intensive if not exhaustive work on *Works and Days*. Painstaking dedication is evident in M.L. West's research with extensive probability of interpretations applied to sections of the poem. M.L. West's translation and interpretation of the poem is an exercise in word (Greek) definitions and applied meanings. As this is an area beyond my skill, I have had to rely on cross-referencing other translations[15] to assure myself that the translation is relatively consistent, as well as Dr. Gordon Shrimpton's interpretation of certain uses of Greek words and phrases.

M.L. West provides an encapsulation of the history of the translations of *Works and Days*, and the scholarly endeavors up to the date of his research (1978 - 88), which I will not repeat or challenge, for it moves out of the area of interest in this thesis and into a debate that is beyond of the scope of this thesis. I will accept M.L. West's contention that *Works and Days*, does contain Near-Eastern motifs derived from what is termed Wisdom Poetry.[16] My interest is in what Hesiod has created and what possible purposes it serves, not whether Hesiod borrowed from the Wisdom Poetry or not. Rather it is the application that interests me.

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[15] Hesiod, *Hesiod, the Homeric hymns, ad Homerica*. Translated by Hugh G. Evelyn-White. London: W. Heinemann, 1914.; Tandy, David W. and Walter C. Neale. *Hesiod's Works and Days: A Translation and Commentary for the Social Sciences.* Berkeley: University of California Press, 1996. Most, Glen W. *Hesiod I*. Cambridge: Harvard University Press, 2006.; Wender, Dorothea. *Hesiod and Theognis*. London: Penguin Books Ltd., 1973.; West, M.L. *Hesiod Theogony and Works and Days*. Oxford: Oxford University Press, 1988.

[16] Contra, Clay, *Introduction* (5) commenting on: "West's catalogue of 'Wisdom Literature'….none of West's examples, it should be noted, depicts a relationship exactly parallel to that of Hesiod and his brother. Closer to Hesiod are some of the longer Homeric speeches, which,….have a paraenetic purpose and frequently deploy similar rhetorical tropes such as myth, allegory, fable, and *gnomai*."

What M.L. West does provide is a guidebook through Hesiod's *Works and Days* including alternative interpretations and explanations, particularly in his 1978 Oxford University Press publication, *Works and Days* which also includes a prolegomena and commentary on a line by line basis. In doing so, M.L. West observed that "on the subject of woodcutting the poet has some quite technical knowledge to impart; one might almost think he was more of an expert on this than on anything else he deals with" (West 1978, 53). M.L. West's observation will be examined and employed in this argument.

M. L. West's 1988 translation is recommended for an in-depth read of Hesiod's *Works and Days* complete with endnotes that reflect M.L. West's earlier publication. I should note that M.L. West makes the assumption that Hesiod "would [have spent] his boyhood playing around the village, herding animals and generally helping on the farm" (M.L. West 1978, 31), which I shall challenge.

I sought out more recent scholarly research on *Works and Days*, keeping to scholars that referenced M.L. West as their main source. Maria S. Marsilio[17] is one such scholar working from M.L. West's analysis. Marsilio suggests that "Hesiod treats the farmer's agricultural life as analogous to his own virtuous life as a poet" (Marsilio 15), which for Marsilio suggests that *Works and Days* is a unified promotion of a poet's life as a just life. In the ancient world the delivery of a poem was usually a performance piece, an interactive experience between the audience and the poet / performer.[18] Marsilio seems to suggest something

[17] Maria S. Marsilio, *Farming and Poetry in Hesiod's Works and Days* (Lanham: University Press of America, 2000)

[18] Personal communication with Dr. G. Shrimpton 2005.

similar in her argument. Important to our interests is Marsilio's questioning of where Hesiod is positioned in the environment that surrounds him in the poem.

In a sense, Marsilio is assigning a 'place' for Hesiod; that is as a poet within the poem. I became interested in how Marsilio's thesis argues for the "agricultural life" of a farmer to be "analogous" to Hesiod's "life as a poet" which positions Hesiod as a poet more so than a farmer in his community (Marsilio 15). I examined David W. Tandy and Walter C. Neales[19] translation and commentary of 1996, which is a referenced source used by Marsilio, as a potential comparative that takes the stance that Hesiod was a farmer. This translation seemed to be tailor-made for my quest as it was subtitled: A *Translation and Commentary for the Social Sciences*.

Tandy and Neale's thesis is that "Hesiod's poem is important to scholars because it sheds light on the universal plight of the peasantry throughout human history" (Tandy and Neale 1), which is followed a few pages later by the assumption that "*Works and Days* was composed shortly after 700 B.C.E. by a farmer who worked a parcel of land near Ascra, a village within the political sway of Thespiae, a *polis* (city-state) in Boeotia" (Tandy and Neale 5). Certainly, Tandy and Neale's positioning Hesiod as a farmer is not at odds with the environment the poem reports, but this thesis explores the questions of whether the environment is meant to support the persona or is it to merely reflect the real life of a farmer. I shall challenge Tandy and Neale's thesis that Hesiod is the voice of 'peasant' farmers.

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[19] David W. Tandy and Walter C. Neale, *Hesiod's Works and* Days (Berkeley: California University Press, 1996)

I became intrigued by Marsilio's idea of a unified theme threading through *Works and Days* that was beyond farming, justice and a proper life. I began to read *Works and Days* as a unified argument for the *oikos* as a working social system. I searched for other scholarly works that offered a similar read of *Works and Days* as a unified piece. I found two publications, Jenny Strauss Clay's *Hesiod's Cosmos*, and Anthony T. Edwards' *Ascra*, two arguments for thematic unification within *Works and Days*. Clay through *Hesiod's Cosmos* not only argues for unification of theme within *Works and Days* but extends that argument to include the *Theogony* as part of a whole;[20] an explanation of the heavens and earth – how it works.[21] Clay examines the role of the gods in *Works and Days* which leads to the state of things, the *etetuma*[22] which Hesiod "expounds" (Clay 140). Further, Clay suggests that "the *etetuma* he expounds are those things he knows from lived experience, matters for which he does not need the Muses' help" (Clay 140). Notably, Clay accepts Hesiod's declaration of possessing limited navigational skills: "Hesiod, however, confesses to little personal knowledge of sailing and must rely on the Muses for his information" (Clay 45).

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[20] Jenny Strauss Clay, *Hesiod's Cosmos,* (Cambridge: Cambridge University Press, 2003), 80. "…the *Works and Days* characterizes itself in opposition to the *Theogony*: the latter, through the mediation of the Muses, offers an Olympian perspective on the cosmos; the *Works and Days*, by contrast, directly and without the need for a divine intermediary, presents the human viewpoint. The task these two poems set for us entails highlighting these two visions and, while respecting their differences, integrating their perspectives into a larger whole."

[21] Clay, 81. "…from its beginning, the Theogony opens an Olympian perspective on the cosmos. Human beings, ephemeral creatures that they are, are necessarily confined to its margins. To study the origins and nature of mankind in Hesiod, we must, at least temporarily, turn our backs on the heights of Olympus and return to more terrestrial level of the *Works and Days*, where the origins of mankind constitute the focus Hesiod's myth of the five races."

[22] Clay, 32. "real things or 'reality'."

Conversely, Clay suggests that Hesiod's knowledge of farming has been derived through personal experiences; hence he does not need the Muses to relay the information (Clay 140). I will draw attention to the level of knowledge Hesiod does offer and suggest that the navigational knowledge is at the same level of knowledge as the farming knowledge – rudimentary. There is a question of the level of knowing that Hesiod presents, this will play an important role in this thesis in the analysis of what is being presented in *Works and Days.*

The other work, which offers insight into the role of the *oikos* as a social-political system, is Anthony T. Edwards' 2004 publication *Ascra*. Edwards argues that *Works and Days* is promoting a social system inherent to Ascra; which tends to echo Tandy and Neale's political theory that Hesiod represents the peasantry, a sentiment also expressed by Finley's comment that Hesiod was no mere "mouthpiece" of the elite. The critical exploration of *Works and Days* in this thesis will challenge this idea.

Edwards mounts an argument that deals with the issues of the autonomy of Ascra, Hesiod's locale; was it under the influence of the larger community of Thespiae? Edwards suggests that Hesiod is arguing for an autonomous community, a pre-*polis* form of community free from the control of the lords of Thespiae. The issues of inheritance between Hesiod and Perses are focused on exploring the process relayed in *Works and Days*. In Edwards' view, Hesiod is preventing Perses from taking the matter to the lords of Thespiae to judge. Edwards suggests that there already exists a perfectly good system in the Ascra community to deal with disputes. Edwards' thesis tries to establish a social

environment derived through his interpretation of *Works and Days*. In doing so, Edwards relies heavily on Tandy's 1997 publication *Warriors into Traders*. Edwards, following Tandy and others, repeats the same assumptions about Hesiod; however, Edwards concludes, "Hesiod …is no peasant" (Edwards 7). Edwards sidesteps the issue of Hesiod's status by concentrating on the structure of the community of Ascra. Not unlike Marsilio and Clay, I shall explore Hesiod's environment and place within *Works and Days* as a character, a symbolic stereotype; in part to determine a possible explanation of Hesiod's social status and to set a value on the information expounded. I shall argue that Edwards was right to declare that Hesiod was no peasant.

Chapter 1

The Construct of Hesiod

The poet or poets of *Works and Days* create a persona for 'Hesiod' by generating a precise *mise en scène*[23] that clothes Hesiod in the trappings of a farmer. I am interested in how the poet constructed 'Hesiod the farmer'. What is the supporting imagery in *Works and Days* that defines and projects the image of 'farmer'? I approach the image through the analysis of the imagery – why does Hesiod look and sound like a farmer, when, as I will show, he probably was not. My interest is particularly focused on whether the farmer's 'voice' echoes my own experiences as a farmer and those of farmers I know and have known or have met and shared conversations with about farming life. I shall first attempt to determine the centrality of the image.

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[23] Sylvan Barnet, Morton Berman, and William Burto, *A Dictionary of Literary, Dramatic, and Cinematic Terms* (Boston: Little, Brown and Company, (1960) 1971), 38. The term *mise en scène* is defined as "the staging of the drama, including scenery and properties (movable furniture) as well as the positions and gestures of the actors." Traditionally the literary view would be to define the 'setting' of the poem. I however have chosen to view the content of the poem as a *mise en scène*, which speaks towards the idea that the poem was a performance piece, therefore a dramatic term is more appropriate to use. West uses the term *mise en scène* in the following manner; "the later sections on sailing (618-94) and the days of the month (765-828) ….have less connection with the original *mise en scène.*" (1978, 45)

The character of 'Hesiod the farmer' is presented to us as both a farmer and the narrator of the poem. I will question the information and imagery Hesiod uses to develop the 'voice' of a 'farmer' speaking; is there actual farming knowledge being offered? Further, I will explore elements of the *mise en scène*, searching for references to two of the main concerns in farming: the weather and the soil (which transcend cultures and time) viewed from a personalized farming standpoint. I will often question how the supporting imagery generates the persona of Hesiod as a farmer and the sense of 'place' in which Hesiod resides.

Hesiod's Complaint and Solution

At the outset, we see Hesiod talking to his brother over their divided inheritance, which is a farm:

> Perses, lay up these things in your heart, and do not let that Strife who delights in mischief hold your heart back from work, while you peep and peer and listen to the wrangles of the court-house. Little concern has he with quarrels and courts who has not a year's victuals laid up betimes, even that which the earth bears, Demeter's grain. When you have got plenty of that, you can raise disputes and strive to get another's goods. But you will have no second chance to deal so again: nay, let us settle our dispute here with true judgement which is of Zeus and is perfect. For we already divided our inheritance, but you seized the greater share and carried it off, greatly swelling the glory of our bribe-swallowing lords who love to judge such a cause as this. (*Works and Days* 35-40)

At issue for Hesiod is Perses' suggested desire to acquire more than a fair share of the inheritance (in Hesiod's perspective). The conflict over the farm

establishes a foundation for discussions of justice and piety achieved through hard work (*Works and Days* 35-40, 210-215, 265). Hesiod scolds Perses:

> …strip to sow and strip to plough and strip to reap, if you wish to get in all Demeter's fruits in due season, and that each kind may grow in its season. Else, afterwards, you may chance to be in want, and go begging to other men's houses, but without avail; as you have already come to me. But I will give you no more nor give you further measure. Foolish Perses! Work the work which the gods ordained for men, lest in bitter anguish of spirit you with your wife and children seek your livelihood amongst your neighbours, and they do not heed you. Two or three times, may be, you will succeed, but if you trouble them further, it will not avail you, and all your talk will be in vain, and your word-play unprofitable. Nay, I bid you find a way to pay your debts and avoid hunger. (*Works and Days* 390-400)

advocating hard work as the proper way of life:

> First of all, get a house, and a woman and an ox for the plough – a slave woman and not a wife, to follow the oxen as well – and make everything ready at home, so that you may not have to ask of another, and he refuse you, and so, because you are in lack, the season pass by and your work come to nothing. Do not put your work off till to-morrow and the day after; for a sluggish worker does not fill his barn, nor one who puts off his work: industry makes work go well, but a man who puts off work is always at hand-grips with ruin. (*Works and Days* 405-490)

which makes it appear that the work advocated is farming.

Hesiod the Farmer

Hesiod outlines some general fundamentals of the seasonal ploughings, seeding, harvesting (based on astronomical positions - signs) and storage. 'Hesiod' enters the poem speaking and advising as if he were a farmer; the image of 'Hesiod the farmer' is immediately created. Hesiod the character therefore speaks first with a farmer's 'voice' relaying the 'voice's' consciousness of the world around him. Hesiod the character creates the elements of the *mise en scène*, which establishes the sense of 'place'. This 'place' is evidently a farm -- the inference that the character in that 'place' must be a farmer appears unavoidable.

A literary character requires 'place'. A description of someone clinging to the face of the Matterhorn suggests 'Mountain climber,' not 'farmer'. In *Works and Days* the first constructed place appears to be an urban centre[24] (not defined clearly) that Hesiod refers to and declares as corrupt, "while you peep and peer and listen to the wrangles of the court-house" where bribery seems to be the method to extract a favourable verdict, "greatly swelling the glory of our bribe-swallowing lords who love to judge such cause as this" (*Works and Days 2*5-40). Hesiod associates Perses with the urban sphere, while Hesiod at the same time puts himself in opposition to what takes place within the urban sphere. The stance of grumbling about the urban sphere (the court) is set against the notion

[24] There is considerable debate on what Hesiod is referring to when he mentions a more centralised place that holds administrative functions. Edwards examines this question in some depth in *Hesiod's Ascra.* See pages 1-29 for the debate on where Hesiod may be referring to: Ascra or Thespiae.

of income associated with Demeter's grain, which appears to suggest a rural sentiment. Notably, Hesiod's persona as a farmer is developed in more depth starting some three hundred lines later in the poem. The concerns of the poet or poets of *Works and Days* in the first three hundred lines appear to have more to do with mythology and the urban sphere, in association with economics rather than with referencing farming directly. I will revisit Hesiod's urban centre a little later in the argument. The poem also establishes several other 'places'.

Hesiod's Farm and the Climate

The first 'place' I would like to explore is the farm over which Hesiod and his brother are in dispute. The layout of the land is not described directly, rather Hesiod provides a climatic commentary that suggests the condition of the land was marginal but certainly from the focus of the hamlet rather than his farm, "a miserable hamlet, Ascra, which is bad in winter, sultry in summer, and no good at no time" (*Works and Days* 635-640). However, this has not stopped scholars from reading in a description of Hesiod's farm within the line.

For example, Tandy and Neale's thesis is that "Hesiod's poem is important to scholars because it sheds light on the universal plight of the peasantry throughout human history,"[25] which may be reading into the poem a viewpoint that may not be there. The description of Ascra may well be a metaphor or

[25] David W. Tandy and Walter C. Neale, 1.

description of something else. Tandy's reading of this passage is based on N.J. Richardson's suggestion that Hesiod is speaking of his father's village (Tandy 1997, 205). Tandy points out that "to judge from the weather of Boeotia today, it is not the climate about which Hesiod is complaining" (Tandy 1997, 205); but what, then, is his complaint? After all, Hesiod does speak directly of "the pitiful hamlet of Ascra," then, apparently describes a climate of that locale which is at odds with the climatic evidence from archaeological to modern records of that area. Certainly, it appears that the description holds more than a comment on the climate. More importantly, the assumption of what the line describes demonstrates its vagueness.

If we accept that Hesiod is a construct, a persona,[26] the grumbling description bodes well for creating the image of a crusty, persistent farmer who grimly anticipates failure – the conditions appear to be too harsh to farm successfully (the tension between the need to farm and the weather is accented throughout the poem). The image of a grizzly farmer farming despite the odds is not much different from an Epic Hero facing his known fate; both resign themselves to the harshness of life but still push forward. A sharp reality for any farmer is of course the climate, and its markers of the weather:

> Mark, when you hear the voice of the crane who cries
> year by year from clouds above, for she gives the
> signal for ploughing and shows the season of rainy
> winter; (*Works and Days* 450)

[26] Anthony M. Snodgrass, *An Archaeology of Greece: The Present State and future Scope of a Discipline* (University of California Press, 1987), 127. "One thing that we have conspicuously failed to do is to account for Hesiod's disparagement of his family's adoptive home (Works and Days 639-40): certainly Askra, like many places at nearly 1,500 feet above sea level, does not have a gentle winter climate; but his next phrase, *therei argaleei*, often translated 'sultry in summer,' and certainly pejorative in general sense, remains entirely obscure to us and may tell more about Hesiod (or about his chosen persona) than about Askra."

and:

> …if Zeus should send rain on the third day and not cease until it rises neither above an ox's hoof nor falls short of it, then the late-plougher will vie with the early. Keep all this well in mind, and fail not to mark grey spring as it comes and the season of rain. (*Works and Days* 485-490)

A farmer can often blame the weather for a crop failure, so Hesiod's gloomy depiction of the weather is suggestive in that regard. Hesiod also includes piety, however, as a factor for obtaining good weather from the gods; "through work men grow rich in flocks and substance, and working they are much better loved by the immortals," hence, they receive the rain at the right time (*Works and Days* 305-309). So the bad weather may be blamed ultimately on the farmer himself if he fails to appease the gods. Conversely, a successful crop can be viewed as a reward, "yet the will of Zeus who holds the aegis is different at different times; and it is hard for mortal men to tell it" (*Works and Days* 480-485).

The logic of this argument takes us further afield and away from the farm; to fail in appeasing the gods is to fail one's community, as suggested by Hesiod's attention in the following lines concerning the 'just city' and the 'unjust city':

> They who give straight judgements to strangers and to men of the land, and go not aside from what is just, their city flourishes, and the people prosper in it; Peace, the nurse of children, is abroad in their land, and all-seeing Zeus never decrees cruel war against them. Neither famine nor disaster ever haunt men who do true justice; but light-heartedly they tend the fields which are all their care. The earth bears them victual plenty…they flourish continually with good things, and do not travel on ships, for the grain-giving earth bear them fruit.

> But for those who practise violence and cruel deeds far-seeing Zeus, the son of Cronos, ordains a punishment…great trouble upon the people, famine and plague together, so that the men perish away, and their women do not bear children, and their houses become few, through the contriving of Olympian Zeus. (*Works and Days* 225-250)

I will examine this passage in more depth later in the argument. There is also the idea that by not following Hesiod's instructions, failure is nearly guaranteed; though Hesiod does suggest that Zeus, if so predisposed, may grant a good crop to the tardy farmer (*Works and Days* 485-490).

In fact, Hesiod's description of Ascra as "a miserable hamlet" is questioned by John Bintliff and Anthony Snodgrass in "their 1982 survey" which "indicates a surface area of about 25 hectares" (Tandy 1997, 205). Snodgrass concluded that Ascra was "no mere hamlet," and by the physical evidence it appears that it was a central community of some size (Tandy 1997, 205). So, why does Hesiod refer to it as a small cluster of buildings, set in a harsh environment, with seemingly impossible odds for successful farming? The description generates a "miserable" tone, but one that may be more fictive than real. Why would Hesiod write so contemptuously of a populous community?

Hesiod is attempting to generate an image of farmer and to do so he must generate a concept of 'place,' the *mise en scène,* to support this image. A *mise en scène* understood by his audience to be rural, perhaps, but definitely the narrator is to be understood as being a 'farmer'. Insofar as Hesiod places himself in this scene he generates for himself an image. He projects himself into the "wretched village" and thereby creates for himself the identity of an 'unhappy

farmer'. Since the location is fictive to some degree, we may wonder about the reliability of the Hesiodic identity that relies on it. I am, therefore, interested in how the terrain and climate are used to accent or support the character of Hesiod as a 'farmer'; does Hesiod respond to his environment in a similar manner as a farmer would or are the details mere characterisations?

Hesiod's Farm and Soil

Victor Hanson suggests that Hesiod's farm may be near Ascra "a site now identified as lying on the slopes of Mount Helicon at about fifteen hundred feet," perhaps explaining Hesiod's commentary on the environmental conditions of his community. Hanson admits, "there is no exact description of the location of Hesiod's farm" (Hanson 96). Further, in a footnote Hanson describes the Mount Helicon area as "picturesque and fertile" which is hardly Hesiod's description of the village of Ascra (Hanson 96). Rather, Hanson suggests that Hesiod seems to be describing possibly a "hilly area" with "some marginal land" often associated with an "elevated and difficult terrain"; which would make for difficult farming, if indeed Hesiod were farming in that terrain (Hanson 96). This is an unsatisfactory comment, for it does not identify the soil condition Hesiod would be farming, which determines the fertility, and in turn, the viability of the farming enterprise he encourages, besides the methodology. Further, would Hesiod be facing the need to terrace his land? If Hesiod's farm was in the "hilly area" that Hanson suggests is being described and if Hesiod's farmland was up on the

slope in an "elevated and difficult terrain," it would seem that terracing[27] would be required to be able to farm the land.[28]

Terracing[29] the land is a labour intensive activity, which requires ongoing maintenance, which Hesiod does not mention. Hesiod, it appears, may be unfamiliar with the terracing system. Though Hesiod mentions a variable terrain, "the plains…near the sea…rich country…glens and dingles far from the tossing sea" (*Works and Days* 385-390), he does not include particulars on the variances[30] in the methodologies[31] of farming that the variable terrain[32] would command. Each methodology faces its own maintenance demands as a result of

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[27] Alison Burford, *Land and Labor in the Greek World* (Baltimore: The Johns Hopkins University Press, 1993), 111. "These hillsides, once cleared of scrub and stone, could provide a basis for crops with the aid of terrace walls built from the stones that had been cleared off the land to make it workable in the first place."

[28] Burford, 109. "Cultivation generally does not extend very far above the valley floor or the plain, for the mountains tend to rise rocky and abrupt from them, but farmers have always succeeded in creating pockets of land on hillsides by means of terracing if the need of land warranted it. Other techniques for remedying the inadequacies of the land included draining marshy areas so as to bring them into cultivation or to make them accessible to grazing cattle, and irrigating sections of the farm too dry for the crops intended: a commoner alternative to irrigation was to dry-farm, that is, to treat the soil in certain ways so as to preserve as far as possible throughout the growing season the moisture that the winter rains bestowed."

[29] Graeme Barker and David Gilbertson, *The Archaeology of Drylands: Living at the margin* (London : Routledge, 2000), 56. "Mediterranean-zone agricultural complex….this complex, ….consists of cereal (wheat and barley) farming, the cultivation of fruit crops, including grapes, olives, figs and dates, and animal husbandry….landscape management, in the form of hill slope terracing and various forms of irrigation, is integral to the complex as well."

[30] Burford, 75. "The nature of the land dictated not only what animals could be kept and which were unsuitable, but also the kinds of crops that would do well on his land." A farmer accordingly, must have a certain level of intimate knowledge of his land to decide which animals or crops will be best suited for his land.

[31] OECD: The Helsinki Seminar, 68. "In Greece, the strategy for rural areas follows the same logic as that of maintaining a social fabric, with a particular objective of maintaining a cultural landscape that embodies not only traditional forms of agriculture (such as olive groves) but also regionally specific architecture. The abandonment of traditional agriculture specifically adapted to harsh environmental conditions results in a rapid deterioration of the landscape; in particular the development of scrub vegetation (leading to brush fires) and erosion – both resulting in the decrease of biodiversity. The decay of terraces used for orchards and arable agriculture diminishes the surface area for rainwater infiltration, leading to local hydrological imbalance: desiccation impacting ground water resources and stream flow."

[32] OECD: The Helsinki Seminar, 56. "This progressive spread of agriculture favoured adaptations in farming systems that corresponded to regional environmental differences, both in climate, soil structure and topography."

the action of farming on the soil environment.[33] With "the process of tillage and fallowing, of terracing, of irrigation, and drainage" the soil in production is subject to "processes" such as the "erosion of the slopes and the aggradation of valleys."[34]

If indeed Hesiod is growing on sloped land, there certainly would occur soil loss due to erosion, "soil lost from deforested and subsequently cultivated slopes is unlikely to be regenerated unless the land is allowed to revert to its forest cover for many scores, perhaps even many hundred, of years" (Hillel 69).

Soil: the fertile substrate

Soil is rather a generic term and hardly reflects the complexity soil is:

> But just what do we mean by "soil"? A precise definition is elusive, for what we commonly call soil is anything but a homogeneous entity. It is in fact an exceedingly variable body with a wide range of attributes. Perhaps the best we can do at the outset is to define soil as the fragmented outer layer of the earth's terrestrial surface in which living roots of plants can obtain anchorage and sustenance, alongside a thriving biotic community of microscopic and macroscopic organisms. (Hillel 24)

further:

> In general, soil refers to the loose surface of the earth as distinguished from solid rock. Many people, when they think of the word soil, have in mind that material which nourishes and supports growing plants. This meaning is even more general, since it includes not only soil in the common sense, but also rocks, water,

[33] Burford, 121. "The first step in combating the wild tendencies of plants is to prepare the soil for planting….a man who learned his farming at Corinth removed all the stones, as he had done there, when he came to farm at Syracuse, and ruined an estate of good repute…for the grain froze when the removal of stones left it without protection from the cold. Whatever the nature of the soil, it requires replenishment between crops." 121.

[34] Daniel J. Hillel, *Out of Earth: Civilization and the Life of the Soil* (New York: The Free Press, 1991), 69.

> snow, and even air—all of which are capable of supporting plant life. The farmer, of course, has a more practical conception of soil; to him it is the medium in which crops grow. (Millar 1)

The medium in which the farmer grows is:

> … a seething foundry in which matter and energy are in constant flux. Radiant energy from the sun streams into the field, and as it cascades through the atmosphere-plant-soil continuum it generates a complex sequence of processes: Heat is exchanged; water percolates through the intricate passages of the soil; plant roots suck up some of that water and transmit it through the stems to the leaves, which transpire it back to the atmosphere. The leaves also absorb carbon dioxide and synthesize it with soil-derived water to form the primary compounds of life. Oxygen emitted by those leaves makes the air breathable for animals, which consume and in turn fertilize the plants. Organisms in the soil recycle the residues of both plant and animals, thus releasing nutrients for the renewal of life. (Hillel 23)

thus:

> The crucible of this foundry is the soil, a rich mix of mineral particles, organic matter, gases, and nutrients which, when infused with vital water, constitutes a fertile substrate for the initiation and maintenance of life. (Hillel 23)

The soil is not disconnected from the rest of the world; it is affected by the environment it is found in:

> Local natural ecosystems, as pools of nutrients, are composed of five subsystems: the soil and surface flora and fauna, which together form the major recycling components of the system, and the atmosphere and parent material, which are compartments of both nutrient input and output. The soil, itself, is composed of living and nonliving matter. The nonliving portion is a complex of inorganic particles formed by the physical, chemical, and biological weathering of parent material, as well as organic colloids (humus) formed by the decomposition

> of plant and animal matter derived from surface biological community. (Carr 134)[35]

The soil organic matter in part has to come from crop trash, manure or green manure. There are processes within the soil that are affected by the actions of humans such as clearing the land of the forests for grazing or improper farming methodologies, "pastoralism, as well as cultivated farming, can cause a great deal of environmental damage" by merely disturbing[36] the soil surface[37] (Hillel 69). Further, "when rain falls on sloping land, part of it infiltrates and part runs off, in varying proportions"; depending on the soil tilth and depth, the absorption rate[38] varies from a high of 90% to a low of 50%, and the gradient, consequently "as more runoff is induced, accelerated erosion ensues" (Hillel 97). Therefore, "erosion on hill slopes not only deprives the soil of the nutrients and humus

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[35] Christopher Carr, *Soil Resistivity Surveying* (Evanston: Center for American Archaeology Press, (research series Volume 2,1982))

[36] S.Valmis and D.Dimoyiannis and N.G. Danalatos, *Assessing interill erosion rate from soil aggregate instability index, rainfall intensity and slope angle on cultivated soils in central Greece.* Soil & Tillage Research 80 (2005) 139-147. "Soil erosion can be defined as a process of detachment and transportation of soil material. The susceptibility of the soil to erosion, know as soil erodibility, depends on runoff and on the soil resistance to particle detachment by raindrop impact." 139.

[37] Janet I. Sprent, *The Ecology of the Nitrogen Cycle* (Cambridge: Cambridge University Press, 1987), 118. "Once taken into cultivation, the total nitrogen and proportion of organic matter usually drop, although there are exceptions. Not surprisingly, the potentially mineralizable nitrogen also drops as does the carbon dioxide evolved (since microbial activity is reduced)."

[38] E.A. Paul and F.E. Clark, *Soil Microbiology and Biochemistry* (San Diego: Academic Press, 1989), 20-21. "Soil water has commonly been described as existing in three forms: gravitational, capillary, and hygroscopic….gravitational water is drawn through the soil by gravitational forces. This will occur after irrigation or a heavy rain. Immediately after gravitational water has drained away, the soil water is at field capacity. The micro-, or capillary, pores are, however, still filled with water that is available for plant and microbial growth." "With water-sealing of the soil surface, such as may occur during the application of irrigation water or during downpours of rain" (19) the potential of the surface water to erode the soil particularly on slopes is understandable. Under certain conditions such as landslides a combination of factors may be involved, though the point here is that water in or on the soil can cause movement of the particulate and organic matter that make up the soil in ways that negatively impact agriculture. For further discussion on erosion in ancient Greece read: Time, process and catastrophism in the study of Mediterranean alluvial history: a review. John Bintliff *World Archaeology* Volume 33 No. 3 February 2002. 417-435.

naturally concentrated in the topsoil, but also reduces the thickness of the rooting zone and its capacity to absorb and store moisture for crop needs," which in turn would require the farmer to apply specialized methodologies, i.e., ploughing technique or terracing[39] (Hillel 97-98). Hesiod does not expound typical strategies for farming sloped terrain, such as following the contours of the hill horizontally[40] with the furrows. To suggest he is farming sloped[41] terrain and does not need to adapt to the conditions seems to ignore the potential for erosion. For Hesiod, the weather plays a more significant role in describing his village and possibly his farming experiences than the actual growing conditions of the soil. Why does the weather of Hesiod's village play a more dominant role and not Hesiod's personal experiences of farming in relationship to the climate and the description of his farm? Is there something being said indirectly through Hesiod's description? It is important to note that there is a question as to exactly

[39] Julie L. Kunen, "Ancient Maya Agriculture Installations and the Development of Intensive Agriculture in NW Belize", *Journal of Field Archaeology*, Vol.28, No.3/4. (Autumn – Winter, 2001) 325-346. "Agricultural terraces represent the expenditure of time, energy, and skill in land development as such, they provide evidence for the intensification of production. This process can involve both the expansion of cultivation into otherwise marginal areas and the conservation and maintenance of the agricultural potential of existing fields. Moreover, investment in landscape modification indicates both security of land tenure and a (relatively) permanent attachment to place." 327-328. Though, this observation is drawn from Kunen's research into ancient Mayan agricultural practises, it can be applied to terrace farming in general. The Hesiod's lack of attention to terracing suggests he is not familiar with the method.

[40] Earthcare, 105. "Cropping on the contour of slopes prevents water erosion. Row crops can cause sever water erosion if improperly laid on slopes. If row crops are not exactly on the contour, water will follow the rows to depressions, accumulate and break down the ridges, causing gullying….on slopes between 4 and 12 percent, the use of special cropping and tillage practices usually gives satisfactory results."

[41] S.Valmis et al.,140. "Slope affects the hydraulic shear stress and the average velocity, the product of which determines the stream power and thus the erosivity of the overland flow….In some works, soil erodibility (*K*i) is related to a number of measured soil physical and chemical parameters, such as textural composition, aggregate stability, dispersibility, organic carbon content and cation exchange capacity."

what is being described by Hesiod when he relays an image of a miserable climate and to what purpose it serves within the poem and out.

Hanson, though he does not identify how he reached his conclusion regarding where Hesiod's farm lay, suggests it is "on less than prized bottomland" (Hanson 107). Perhaps Hanson also noted that Hesiod does not engage in describing any methods associated with sloped farming, therefore suggesting Hesiod must be referring to bottomland or relatively flat land. The point, I think, that is important is that Hanson is assuming where Hesiod's farmland may lie. This brings to attention the lack of intimate information within the poem, the reader is left to fill in the blanks, as it were, with their own personal imagining of where or what a farm should look like.

Deciding how Hesiod's voice is interpreted is equally difficult. Hanson views Hesiod neither as an elite aristocrat landowner nor as a peasant dirt farmer but rather assumes the Hesiodic voice is from what he terms as the "middling" farmers:

> Greek farmers appearing in the eighth century were *neither* subsistence peasants nor wealthy aristocrats, but rather something in between: the new *polis* agriculture created a new "class," a middling breed rare in agricultural history. (Hanson 105)

Further, the middling breed is presented as "intensive" agriculturists working small plots of land; "with expertise and long, accumulated experience, the intensive farmer learns to adapt particular crops to the many differing individual environments of his farm" (Hanson 76, contra Snodgrass 379). Yet, Hesiod does not provide any sense of this situation, his depiction is devoid of exact details.

Identifying the soil conditions that Hesiod would be working as a farmer is an important piece of information that Hesiod neglects to reveal satisfactorily. I think by understanding the farming conditions the Hesiodic farmer may face growing a successful crop that yields a surplus, may help to define whether the voice is accurate or true to a farmer's voice or may possibly reveal the voice is a poetic device echoing commonly held notions on farming. According to Christos Tsadilas[42] of the National Agricultural Research Foundation Institute of Soil Classification and Mapping in Greece, the soils of the Mt. Helicon area are identified as "alfisols xeralf or rhodo xeralfs," commonly referred to as "red Mediterranean soils."[43] These soils are characterized as "soils with high iron [Fe] and aluminium [Al] oxides content" which gives the soil its reddish tint. Although these soils "have [a] high fixing[44] capacity for phosphorus" and "potassium in general is at [a] sufficient level," according to Tsadilas, the available potassium for plant growth can be taxed with repeated cropping. Tsadilas points out that to

[42] Communicated by e-mail Feb16, Aug.31, 2005. (tsadilas@lar.forthnet.gr)

[43] http://soils.ag.uidaho.edu/soilorders/alfisols.htm "***Alfisols*** are moderately leached forest soils that have relatively high native fertility. These soils are well developed and contain a subsurface horizon in which clays have accumulated. Alfisols are mostly found in temperate humid and subhumid regions of the world. Alfisols occupy ~9.7% of the global ice-free land area. In the US, they account for ~13.9% of the land area. Alfisols support about 17% of the world's population. The combination of generally favorable climate and high native fertility allows Alfisols to be very productive soils for both agricultural and silvicultural use.
Alfisols are divided into 5 suborders: *Aqualfs*, *Cryalfs*, *Udalfs*, *Ustalfs*, and *Xeralfs."* http://soils.ag.uidaho.edu/soilorders/alfisols%20suborders. htm ***"Xeralfs*** - temperate Alfisols with very dry summers and moist winters."

[44] Dr Roy points out that perhaps what is meant here is "absorption availability" or "phosphorus solubility" and the use of the term "fixing" may reflect a problem in the translation and not the information provided.

maintain an "adequate level" of potassium, an application of potassium "should be applied at the appropriate rate every year or two years."[45] For Hesiod to accomplish this he would have to rely on some in-put, like manure.[46]

The issue over the soil conditions[47] Hesiod would be farming is not simple and understanding the complexity of the nature of soil and crop yields highlights the lack of attention to soil on Hesiod's part. If indeed the purpose is to achieve a surplus, as suggested by Hesiod to Perses when Hesiod states, "when you have got plenty of that (Demeter's grain), you can raise disputes and strive to get another's goods," then attention to soil fertility is a must (*Works and Days* 30). When considering improvements to yields, modern research indicates that "improvement in mean farm yield…depends upon the identification of those factors which are responsible for farm-to-farm and field–to-field variation in yield" (Hay and Walker 186). To measure and identify the "factors" becomes a task

[45]C.E. Millar, *Fundamentals of Soil Science,* 305. Potassium "enhances the synthesis and translocation of carbohydrates, thereby encouraging cell wall thickness and stalk strength. A deficiency is sometimes expressed by stalk breakage or lodging."

[46]C.E. Millar, 375-376. "Until the introduction of commercial fertilizers and the general utilization of leguminous crops, manure had always been the main source of supply of plant nutrients. In many places this is still true. The beneficial effects produced by manure on plant growth are believed to be owing mostly to its content of nitrogen, phosphorus, and potassium….In fertilizer terms, it has on the average the analysis of 0.5-0.25-0.5, containing 11/4 units of plant nutrients as compared to about 30 to 40 units in ordinary mixed fertilizers. Although the nutrient content of manure is low, the quantity of nutrients added per acre in a normal rate of application of manure may equal or exceed the quantity applied as commercial fertilizer."

[47] K.L. Sharma, Uttam Kumar Mandal, K. Srinivas, K.P.R. Vittal, Biswapati Mandal, J. Kusuma Grace, and V. Ramesh, "Long-term soil management effects on crop yields and soil quality in a dryland Alfisol" *Soil & Tillage Research* 83 (2005) 246-259. "A very fragile natural resource base typifies many of the dryland areas. Soils are often coarse-textured, inherently low in fertility, organic matter, and water holding capacity, and susceptible to wind and water erosion….Maintaining soil organic matter is also crucial in dryland farming system. As temperature increases and precipitation decreases, the oxidation of organic matter is very fast and development of sustainable farming systems becomes more difficult." 247-248. Hesiod offers no suggestion of maintaining his soil quality, which would include manure or green cropping to maintain the soil organic matter at sufficient amounts to benefit his agricultural enterprise.

that has proven somewhat daunting even for modern science, as indicated by the following statement:

> In practice, this procedure has not yet proved to be possible because of the complexity of the model which would be required to simulate all aspects of growth and development, especially below the soil surface. (Hay and Walker 187)

Therefore, the conditions of the soil, particularly for the ancient farmer, are paramount to understanding crop growth and yields. The following statement further supports this, "many of the remaining factors contributing to yield depression appear to operate in the soil" (Hay and Walker 187). It should be understood that each plot of land could contain a variety of soil conditions that may potentially offer a variety of yield results. Further, the ancient farmer would be unaware of such factors as the nutrient content of manure, but would observe the difference between a manured field and the growth on it compared to a field not dressed with manure and its growth. Without the "tools" of modern science the ancient farmer had to rely on learned observations suggesting a more intimate relationship between the farmer and his fields.

During a recent trip to Japan[48] I observed farmers placing winnowings and rice hulls[49] in certain areas in the fields, drawn from the farmer's memory of that

[48] November 2006: Conversations with farmers from various areas of Japan via friends November 2006, community farmers, re-turned farmer, 8th generation farmer, and newly taught farmer, each farmer was several kilometres apart and up to 1200 kilometres apart, thus representing a variety of soil and climate conditions they faced in farming.

The conversations that took place are not to be mistaken for a structured interviewing process. The information gathered was done so with the intent that it be presented at the level it was presented – as a relaxed conversation between farmers; chatting over the fence. The attention I bring to what I observed is offered as just that, an observation.

[49] The farmers did not use the rice straw as mulch/compost. They claim that burning the straw helps to prevent insect infestations or pathogenic disease. They spread the ash out on the fields after the straw is burnt.

year's crop growth, to be worked into the soil. I was told that it was a method of 'fertilising' the 'weak spots' in the fields where the crops had not fully developed. (This action was not dissimilar from my own experiences of manuring the tops of small hills[50] in the fields being farmed to improve the yield from those patches of often thin, parched and blown soils.) This attention to detail speaks to the notion of variable conditions of the soil from field-to-field. It also speaks of the potentially intimate relationship a farmer can have with each field or plot of land, representing a highly regionalized, localized body of information.

With each field the farmer may encounter different growing conditions, consequently each field may demand a specialized body of information be resident with the farmer to successfully farm the field. Certainly, the farmer must have some knowledge of the field's capabilities to be able to farm in a manner that produces successful surpluses as per Hesiod's claimed objective in enticing Perses to farm. The information or knowledge should not be assumed as applicable universally, as indicated by the following statement:

> Although agronomic experiments of this kind (referencing the Rothamsted research farm) are ultimately only of local value and should be repeated on a range of soils in different environments, they do serve to identify complex and poorly understood sources of yield variation, mainly originating in the soil. (Hay and Walker 187)

Hesiod does not provide any information or knowledge that could be identified as being drawn from his personal experiences, such as demonstrated by the

[50] *Guide to farm practice in Saskatchewan,* 95. "The topsoil on sharp knolls and ridges is usually very thin. On many cultivated knolls and ridges, erosion by water and wind has removed the thin topsoil and exposed the lighter colored soil. Such soils are droughty and low in productivity, and it is most important to build up their content of organic matter."

farmers in Japan recalling the nutrient low spots of the fields and the ability to apply remedial actions. There is a direct relationship between the farmer's observation and the applied solutions stemming from "careful crop husbandry, based on detailed evaluation of crop development by the farmer" (Hay and Walker 187). In other words it is the farmer who knows the fields and the performance on those fields and it is also the farmer that develops the systematic solutions to the varied problems the field can present, particularly when set in the context of the ancient world.

In a modern sense, soil is understood to be a complex system of mineral particles, water with soluble ions and organic colloids, gases and living organisms. The living organisms are particularly important because they speed up chemical reactions by producing very efficient organic catalysts: the enzymes, which are very diverse and allow complete transformation of complex organic molecules into simple minerals.[51] While this thesis can not include a detailed break down of how these relationships relate to crop yields, and the frequency of the yields, a basic understanding of a few of the factors governing the soil is essential to understanding the role the farmer plays in being an observer of the results of the various conditions of the soil environment and producing on-the-farm solutions, particularly for the ancient farmer.

[51] Suggested statement Dr.Roy 2007.

Although an ancient farmer would not have access to soil sciences, they would have, as the Japanese farmers perhaps demonstrate, the memory of each field's performance, possibly under a variety of conditions, which suggests that the knowledge must be resident with the producers. This form of knowledge noted here as hands-on is also knowledge that I experienced as oral knowledge.

As I was learning to farm, the farmer who was teaching me referenced his fields and his approaches to the field including, if applicable, his father's or grandfather's experiences dealing with the same field or even a past owner's experiences with the field. Hesiod does not provide a sense of knowledge being passed down by his father, or for that matter Hesiod does not divulge how it is that he knows how to farm. Hanson suggests that:

> If a generation is skipped, the farm's survival rests on the ability of the elder (in just a few year's time) to transfuse his lifelong proficiency into the grandson before unchecked youthful exuberance proves fatal. (Hanson 147)

Without the ears to hear and the backs and hands to practise what is taught the art of proficient farming will be lost, according to Hanson. Certainly, the idea of the knowledge as being so intimately attached to the farmer's experience that it can only be expressed and shared in the process of farming is not evident in Hesiod's poem as he uses generalisations instead of personal examples. In the personal examples lies the learned knowledge of the reactions of the soil/plant relationship in association with the climate and the seasons.

Signs

I received my knowledge on how to farm orally, and the depth of the knowledge is perhaps best demonstrated by the following, albeit anecdotal experience I had. When I asked how was I to tell when it was time to plant in the spring, the answer I received was that I would smell and feel when it would be the right time to plant.[52] When the right time came around I was taken out to the fields and asked to breathe in the aroma of the sun-warmed soils and to remember each field's smell. Then, I was told to let the sunlight warm my face and the back of my hands, to feel it and to remember the sensation of the warmth. The knowledge offered involves the soil as the central focus. The aroma was generated from the soil, according to my 'teacher,' after it reached a certain temperature,[53] which I was asked to remember (the feel of the warmth of the soil, the air and surface of my skin as a sensual experience). Explained in another way, the rationale of the farmer who taught me is perhaps revealed in the Guide to Farm Practice in Saskatchewan, a publication produced by Saskatchewan Agriculture, Canada Agriculture, Saskatchewan Agricultural Services Co-ordinating Committee and the University of Saskatchewan, which states:

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[52] Celestial positions as a reference to seasonal times, i.e., seeding and harvests, only provide an announcement of the season but do not provide the fine detail of knowing when the soil condition is correct for seeding, i.e., the soil temperature and moisture are adequate for proper germination. It is this fine tuning that is represented above, and I acknowledge that the 'farming' seasons are heralded by celestial positions.

[53] Guide to Farm Practice in Saskatchewan, 5. "In spring, soil temperature at seeding depth must be adequate to promote germination. Where seed lies dormant, due to low soil temperature, a new-sown crop is particularly vulnerable to attack by soil-borne organisms. As well as having a direct affect on the plants, soil temperature influences chemical reaction rates in soil. The availability of some nutrients can be influenced by annual climatic cycle."

> Both air temperature and soil temperature influence plant growth. For each plant variety there is a restricted temperature range over which growth and development can occur. (5)

Hence, knowing when to plant is very much dependent on the soil temperature, moisture and the climatic conditions; even a finer tuning of this notes a range in which various species will grow:

> These limits are called the lower and upper cardinal temperatures. Outside of this range, severe environmental stress limits plant growth and, with further temperature change, death occurs. (5)

Certainly, climate conditions have a more dominant role for the farmer in the decision of what and when to plant, than do celestial signs heralding the planting season. To seed too early, and by that I mean before the climatic conditions warrant planting, or too late, delayed due to a variety reasons such as the soil being too wet or too dry to seed, has a dramatic effect of the crop yield. Indeed:

> Of all the management aspects of growing a cereal crop (cultivar selection, seed rate, amount and timing of fertilizer, etc.), sowing date is probably the most subject to variation because of the very great differences in weather at sowing time between seasons even within the range of climates highly suited to arable agriculture. (Hay and Walker 168)

Variable climatic conditions influence the response of the farmer more so than trying to plant according to lunar phases or celestial positions, these again must be viewed as guides and not hardened ‘truths’. Indeed:

> …the results of sowing date experiments can be highly inconsistent between seasons and sites: for example, it is not unusual for a relatively late sown crop to outyield the ‘control’ crop sown within what would be considered to be the optimum period. (Hay and Walker 168)

Even Hesiod with his rudimentary information provides evidence of a similar occurrence:

> Yet the will of Zeus who holds the aegis is different at different times; and it is hard for mortal men to tell it; for if you should plough late, you may find this remedy – when the cuckoo first calls in the leaves of the oak and makes men glad all over the boundless earth, if Zeus should send rain on the third day and not cease until it rises neither above an ox's hoof or falls short of it, then the late-plougher will vie with the early. (*Works and Days* 485-490)

Hesiod appears to have a date in mind that he considers to be an optimum ploughing and seeding time. This more ritualized approach towards agriculture does not provide the flexibility the farmer has to exercise in the decision to seed. Indeed:

> The year-to-year variation in plant establishment, pest and disease incidence, and in winter-kill makes it very difficult to predict optimum sowing dates for cereals on purely physiological grounds…in accepting such guidelines ([sic] such as the lunar phase or celestial position for Hesiod), several reservations must be appreciated, in addition to the fact that use of the recommended date is not a guarantee of highest yield for that season. (Hay and Walker 173)

Hence, the fine-tuning of the knowledge of when to plant resides with the farmer in association with his understanding of his field's condition. Therefore, the farmer[54] must be able to determine the optimum time to seed based on the 'signs' beyond the celestial guides and must pay attention to the more intimate signs of what the soil, the climate and the seed type demands. Applying his own

[54] I am not suggesting all farmers have developed the same system as was taught to me, I do contend though, that each farmer has a system of knowing when to plant that involves a fine tuning or understanding of the conditions they are dealing with and respond accordingly.

understanding according to his farming experiences, be it shown in the aroma or the look of the soil, or the temperature of the sunlight on the farmer's skin, the farmer's intimate knowledge becomes the dominant factor in the decision to plant.

Hesiod relies on celestial guides to determine when to plant or harvest. Many societies have had a ritualized system revolving around the agricultural year and celestial positioning. Great ceremonies and observances have been mounted to mark or herald the start of the seeding season or the harvest season. This is, however, a generalized outgrowth of understanding the cycle, and it does not enter into a more condition specific level of information. For example, Hugh Campbell,[55] a Saskatchewan farmer, speaking on legumes in crop rotations indicates a time frame of planting his field peas:

> I've planted from the beginning of May up to June 6th, with the earliest batches maturing in the middle of August and everything swathed by the end of August. (36)

which certainly encompasses a single lunar cycle.[56] Campbell[57] offers an example of another farmer who plants his crops of the same species of field peas "on June 6th," and harvests the crop in "October." Again, the phases of the moon

[55] Hugh Campbell, "Use of Legumes in Rotation," *Ecological Agriculture Update* March 2 1987, Saskatchewan Environmental Society, 25-37.

[56] Pam Tempelmayr, "The night sky has agricultural ties", *Saanich News*, 5 September 2007. The gardening writer of the Saanich News suggests that there are "two basic rules: Plant your seeds during the growing or waxing phases. These are from the new moon, up to and including the full. The belief is that the seeds will grow faster, receiving full benefit of the growing energy of Luna. Plant your root crops during the diminishing or waning phase. The reasoning being that crops, which grow under the soil, in the dark, will get a better beginning when there is the least amount of light." (A15)

[57] Campbell indicates he has planted on either side of the phase of the moon, if the moon was the ultimate dictation of when to plant, there is a reasonable expectation of Campbell being able to state the phase in which he plants, which would have been stated, rather it is the condition of the soil and environment that hold the ultimate 'sign' of when to plant.

or other celestial positions in use as guides do not determine the final decision when to plant or harvest. For example, Judy Ternier[58] a mixed farmer from Saskatchewan states:

> I seed when the poplar come out in leaf…last year I was delayed slightly more than I'd planned due to a couple of days of rain. (42-43)[59]

Importantly, Ternier indicates that she was delayed due to rain, the weather altered the date of her planned planting and not the phase of the moon or some other celestial positioning. Campbell indicates a four-week period in which he has planted. His decision was dictated by the soil conditions and the weather, apparently more than by the phase of the moon or other celestial positions. The same is true with Ternier; the ground was too wet, and perhaps too cold to seed or even too dry. There is certainly a sense of an optimum time to plant and harvest based on celestial positions, but it is the intimate knowledge the farmer has about his fields' condition and drawing from his experiences that the decision to plant or harvest is drawn from (I personally experienced a variable as much as three months for harvesting times). Hence, it should be understood that planting or harvesting is condition specific and not particularly celestial positioning specific. Therefore, a sense of personal experience with a variable range of planting starts and harvests should be expected from a true farmer; Hesiod is

[58] Judy Ternier, "Sustainable Agriculture", *Ecological Agriculture Update* March 2 1987, Saskatchewan Environmental Society, 42-43.

[59] Ternier's comment is similar to observation offered by Hesiod: "when a man first sees leaves on the topmost shoot of a fig-tree as large as the foot-print that a crow makes" (*Works and Days* 678-681) however in reference to going to sea and not farming, but none-the-less Hesiod notes this as a sign of spring.

however silent on having experienced a variable in his planting times and harvests.

Variables in Soil

For example, if Hesiod's fields were near Mt. Helicon they would be *alfisol xeralf* soils. Reportedly, the *alfisol xeralf* soils of Mt. Helicon area have a "high content of iron and aluminium oxides" that "have a high fixing capacity (absorption availability or phosphorus solubility) for phosphorus."[60] This should be understood as a generalized statement, which does not address potential individual situations that may realize soil pockets with acidic or alkaline pH levels which can alter the availability of phosphorus and other nutrients for plant growth. The pH level of the *alfisol xeralf* soils affects the "fixing capacity (absorption availability or phosphorus solubility)" of the element phosphorus, the more acidic the soil is the higher the reduction in available phosphorus. Notably, phosphorus is an essential element for plant growth; any reduction in the availability has a direct affect on the plant's health and its yield.[61] "Like nitrogen, it is a constituent of every living cell," therefore a key element in plant growth. Phosphorus is thought to play:

> …an important role in energy transformation in the cells of both plants and animals. As such it is necessary for normal transformations of carbohydrates in plants – the changing of starches to sugar. (Millar 303)

[60] Tsadilas.
[61] Millar, 139-140.

Thus, phosphorus aids in maturing the plant, such as wheat turning golden brown from a dark green. There are several variables, which can effect the availability of such elements as phosphorus, which requires a response from the farmer. In a sense, the farmer has to be a micro-manager,[62] working closely with every detail, suggesting that each field has its own characteristics,[63] and that through a farmer's observation these characteristics become known.[64]

Soil Nitrogen, Phosphorus and Potassium

I would like to focus now on the role of three elements within the soil: nitrogen, phosphorus and potassium in producing healthy plants from a microbial standpoint. Common fertilizers in use today utilize a three-element system of identifying the 'concentrations' of key elements, nitrogen (NH_3) – phosphorus (P_2O_5)– potassium (K_2O); e.g., 20 – 20 – 20 fertilizer. The "fertilizers do not consist of the elements nitrogen, phosphorus, and potassium as such, but they are combined with other elements to form either organic or inorganic

[62] Conversation with former neighbour Milton Foulds, Jackpine Road, Glaslyn, Saskatchewan January 2007. Recently farmers have begun to use GPS units in their tractors to steer the units back and forth across their fields with deft accuracy, eliminating over-lapping, of fertiliser or seed. The aim of these innovations is to control farming costs by maximising returns, through a more controlled methodology and in some cases a re-tooling of the means. Perhaps, in time the intimacy between the farmer and the fields will be lost to the digital world.

[63] C.Chang and C.W. Lindwall, "Effect of Long-Term Minimum Tillage Practices on Some Physical Properties of Chernozemic Clay Loam" *Canadian Journal of Soil Science* 69 (1989), 443-449. 444 "…the effects of tillage on the soil physical properties are reported as being related to soil type, type of tillage equipment, tillage depth, soil conditions such as moisture content at the time of tillage, and climatic conditions. Therefore, the effects of tillage on soil physical properties should be determined at each location." The farmer must be the observer and analyst particularly in the ancient world to respond to the soil needs or conditions of his fields revealing a level of intimacy between the farmer and the land through his knowledge.

[64] Mary Keil, a Blenkinsop Valley farmer (65 years farming). "Each field is like a person, it has its own personality, and a farmer has to get to know that personality before they can farm the field." April 2006.

compounds."[65] It is important to keep in mind that "although fertilizers may affect the soil and plant growth in a number of different ways, they are used primarily to increase the supply of available plant nutrients in the soil and also to *balance* the plant-nutrient ratio."[66] Fertilizers affect the microorganisms that "are responsible for many transformations in soil related to plant nutrition and health" by providing "food" or "fuel" for the "bacteria, actinomycetes, fungi, algae, viruses, and protozoa."[67] The "bacteria and fungi" act as the "primary decomposers in the cycling of nutrients," consequently by ensuring that these groups receive the raw material (e.g., manure) for decomposition, the process of the "nutrient cycles" can revitalize the soil.[68]

Soil Nutrient Cycles

The concept of 'cycling' is related to the interrelationship between the chemical reactions of elements, i.e., carbon (C), nitrogen (N), etc., and microbial activity within the soil that change and alter organic and inorganic compounds. If there is a depletion of any of the elements, which changes the soil environment, the conditions for the soil microbial populations change and with that change there is an altering of the microbial populations and their activities which can affect the availability of nutrients for plants. For example:

> …an important general point is that, in nearly all agricultural areas of this planet (areas where

[65] Millar, 314.
[66] Millar, 314.
[67] Wanda W. Collins and Calvin O. Qualset, *Biodiversity in Agroecosystems* (CRC Press, 1999), 4-6.
[68] Collins, 4.

> shortages of sunlight and/ or water supply do not limit crop growth), biological productivity is determined by the availability of inorganic nitrogen in the soil. This means that in all but highly sophisticated agricultural communities, the rate at which the cycle turns determines biological productivity. (Postgate 1-3)

It becomes clear that farming is not as simple as ploughing the soil and placing seeds in the ground. Like phosphorus, "the element nitrogen is an essential constituent of all living things," therefore it is essential to have nitrogen in an available form in the soil to produce healthy yields (Postgate 3). For Hesiod to farm his land,[69] he has to maintain a certain level of available nitrogen within the field to produce the surpluses he encourages Perses to pursue. He has four options: one is to apply manure, the second is to turn in the harvest thrash (like the Japanese farmers), the third is to include the use of cover crops such as legumes, and the fourth is to fallow the land for an extended period (the land is taken out of production, equating a loss of income). A farmer may employ any or all of these options to his situation. If Hesiod used legumes as a green manure, he would have to plough the crop under, usually at the flowering stage, but there is no suggestion that he is engaged in such practice. In some cases there are some soils that do not benefit from "legume crops in rotation because they tend to dry out the soil" (Earthcare 24). However, generally "green manure is a crop grown to be turned under to decompose and contribute to soil fertility and tilth" (Earthcare 75). If indeed Hesiod is growing on a slope, green manuring has another benefit in that it adds "organic matter" which in turn "improves soil tilth,

[69] K.L Sharma et al., 247. "Maintaining soil quality at a desirable level is a very complex issue due to involvement of climatic, soil, plant and human factors and their interactions. This issue is even more challenging in case of dryland farming."

…the organic matter stabilizes soil structure, increases the water-holding capacity of the soil, and increases the water infiltration into the percolation through soil; these contribute to erosion control" (Earthcare 75). Further, green manure "protects fallow soils from erosion" which would benefit Hesiod's operation, particularly if he is farming on a sloped terrain (Earthcare 75).

During the process in which "bacteria break down the green manure organic matter, incorporating part of it into their tissues…weak acids are released which can dissolve insoluble nutrients, such as phosphates in high calcium soils" the point again is that different conditions within the soil[70] affect the bio-chemical relationships within the soil (Earthcare 75). The differences would appear readable to the farmer, as they did to the Japanese farmers, and as they did to farmers I have worked for, and as I even notice in my own farming, landscaping and gardening. The lack of nitrogen shows up in many plants as weak stems, leaf tips a yellowish colour, overall pale green colouring, limp leaves - often small, stalled growth. Having an 'eye' for nitrogen deficiency makes it 'diagnosable'. Hesiod is silent on witnessing nitrogen deficiencies, i.e., yellowed and weak crop, as he is on his options to access nitrogen and seems to be blithely unaware of this key element in successful crop production, albeit, in the form of animal manure or green manure. To suggest that this relationship was unknown is to suggest that farmers were able to grow crops despite the reality of the bio-chemical nature of the soil and plant growth. Though truly understood by

[70] K.L. Sharma et al., 247. "Soil is a key natural resource and soil quality is the integrated effect of management on most soil properties that determine crop productivity and sustainability. Good soil quality not only produces good crop yield, but also maintains environmental quality and consequently plant, animal and human health."

the ancient farmer in a differing manner than chemical reactions, microbial activity, cycles and up-takes, the observation of these relationships is demonstrated in the productivity of the soil under cultivation.

Understanding that "plants require several mineral elements for normal growth"[71] and that depletion in the availability of any of the nutrients has an affect on the plant's growth, accents the need to understand the 'markings' of deficiencies. The lack of such elements as "nitrogen, phosphorus, potassium, calcium, magnesium, and sulfur" which are "needed in relatively large amounts" and are noted as "major elements" have a dramatic effect on plant yields and can occur whether farming now or in the ancient world (Agrios 568). The minor or trace elements (micronutrients) "like iron, boron, manganese, zinc, copper, molybdenum, and chlorine, needed in very small amounts" are equally as important in plant growth and health as the major elements, "both major and trace elements are essential to the plant" (Agrios 568). Effectively, when the nutrients "are present in the plant in amounts smaller than the minimum levels required for normal plant growth, the plant becomes diseased and exhibits various external and internal symptoms" (Agrios 568). Again, the relationship between the soil and its productivity is something a farmer can observe through the "symptoms" which "may appear on any or all organs of the plant, including leaves, stems, roots, flower, fruits, and seeds," which the farmer has to 'read' to effectively react to the situation. Hesiod does not impart such information to Perses; instead Hesiod's focus is on hard work and piety, which would not

[71] George N. Agrios, *Plant Pathology* (New York: Academic Press, 1969), 568.

remedy a field (apart from a brief mention of fallowing [see below note 74]) experiencing low nitrogen content.

If indeed Hesiod were a farmer he would be subject to 'knowing' the signs of trouble within his crop. Basically deficiencies appear as the following:

> Nitrogen:
> The plant grows poorly and is light green in color. The lower leaves turn yellow or light brown and the stems are short and slender. Nitrogen is essential for proteins (including enzymes), chlorophyll and numerous other plant compounds and, therefore, nitrogen deficiency affects plant growth in many ways at once.
>
> Phosphorus:
> The plant grows poorly and the leaves are bluish green with purple tints. The lower leaves sometimes turn light bronze with purple or brown spots. The shoots are short and thin, upright and spindly. Phosphorus is associated with almost as many of the same vital functions in the cell as nitrogen. Deficiency in phosphorus interferes with the performance of these functions. Phosphorus is a constituent of nucleic acids, phospholipids, and [most proteins, sic][72] and is necessary for the metabolism of carbohydrates, fats, and proteins and for respiration.
>
> Potassium:
> The plant has thin shoots. In sever cases dieback may occur. Older leaves may show slight chlorosis with typical browning of the tips, scorching of the margins, and many brown spots usually near the margins. Potassium seems to be essential to many plant functions, including synthesis of carbohydrates and proteins, regulation of cell hydration, and catalysis of reactions, but its exact role is not well understood.
>
> Magnesium:

[72] This statement is incorrect, phosphorus is not found in proteins. Dr. Roy explains; "Proteins are made of N and S but not P. Nucleic acids are made of N and P but not S." (Nitrogen, Sulfur and Phosphorus) private communication 2008.

> First the older leaves and then the younger ones becomes mottled or chlorotic, followed by redding and, sometimes, appearance of necrotic spots. The tips and margins of the leaves may turn upward so that the leaves appear cupped. Defoliation may follow. Magnesium is a structural component of chlorophyll and the cofactor for many enzymes involved in carbohydrate synthesis. Magnesium deficiency, therefore, results in reduced chlorophyll synthesis and chlorosis.
>
> Calcium:
> Young leaves become distorted, with the tips hooked back and the margins curled. Often the leaves are irregular in shape and ragged, with brown scorching or spotting. Terminal buds finally die. The plants have poor, bare root systems. Calcium regulates the permeability of membranes, forms salts with pectins in the middle lamella and cell walls, and influences the activity of several enzymes active in the meristematic cells of the growing points. Its deficiency, then, interferes with these functions.
>
> Sulfur:
> The plant has pale green or light yellow young leaves without spot formation. These symptoms resemble those of nitrogen deficiency. Sulfur is a component of some amino acids, vitamins, and coenzymes, and seems to be related to chlorophyll formation although it is not a constituent of the chlorophyll molecule. (Agrios, 568-571)[73]

Hesiod may not have been able to point to a particular element as being deficient in his field; but he would as a farmer realize the 'signs' of a troubled crop. Again, in the ancient world the most likely remedies were to manure the field, with either animal or green manure, or to fallow the land[74] for a period of

[73] Agrios, George N. *Plant Pathology*. New York: Academic Press, 1969: This excerpt was published in *Plant Pathology*, pages 568-571, Copyright Elsevier Limited (1969). Used with permission by publisher and author (February 21, 2008).

[74] Hesiod, *Works and Days,* 460. "But fallow broken up in the summer will not belie your hopes. Sow fallow land when the soil is still getting light."

seasons.[75] The later writers on agriculture (see note 76) certainly realized that there was indeed a relationship between soil maintenance and crop production since they included manuring regimes and cover crop practices within their treatises on agriculture. At the very least there is acknowledgement of a body of knowledge, which reflects an on-the-ground experience of farmers – the need to be observant, and to know how to react to the symptoms observed. The farmer who has intimate details of the field to plant relationship exercises the fine-tuning of this system.

Nutrient Return

In the ancient world the material available to reincorporate nutrients back into the soil environment, as mentioned, was animal manure, green manure, crop trash (straw) and fallowing the land for an extended period of time (not a profitable choice). [76] Manure, which is generally a mixture of urine, faecal and organic material, such as straw used as bedding,[77] contributes to the NH_3-P_2O_5-K_2O (Nitrogen-Phosphorus-Potassium) content of the soil but also contributes

[75] OECD: The Helsinki Seminar, 56. "Neolithic agrarian system without major change, with the first component being a three-stage cropping pattern of winter cereals (wheat and barley) followed by millet and then a long fallow period, making a two year cycle."

[76] Burford, 121. "Whatever the nature of the soil, it requires replenishment between crops; the standard practice as Hesiod, Xenophon, and Theophrastus see is to let grainland lie fallow for a year and keep it well turned over and free of other growth." Hesiod does not indicate that he has fallowed a section of his farmland. This would be a key piece of information for Perses to know – he must fallow a percentage of his land each year to maintain the soil fertility.

[77] P.J. Thorne and J.C. Tanner, *Livestock and nutrient cycling in crop-animal systems in Asia*. Agricultural Systems 71 (2002), 112. "this practice is directed at the effective trapping of nutrients voided in faeces and urine and, as such, represents an aspect of interface between livestock and the land."

organic matter (humus) which plays an important role in the nitrogen cycle. As the manure decays in the soil, a process takes place termed *ammonification*:

> Inorganic nitrogen is returned to the cycle from organic matter as a result of autolysis, decay and putrefaction of biological material, and the principal form in which it appears is as ammonia. The general process is referred to as ammonification. (Postgate 5)

As ammonification "contributes free ammonia to the biosphere" another process termed *nitrification* takes place as, "two classes of bacteria" begin to digest the ammonia[78] "by oxidizing the ammonia to nitrate" (Postgate 6). What this means is that the "nitrifying bacteria perform a valuable function in rendering the nitrogen of ammonia more readily available to plants" which can only take place if the correct "fuel or food" is present for the "cycle" or "process" to establish (Postgate 6-7). Therefore, an application of manure, or another source of food for the nitrifying bacteria would be essential in maintaining, for example, available nitrogen levels for plant growth in any one field. Hesiod seems to ignore this part of the 'formula' for successful farming, which is one of the more important factors in obtaining a healthy crop today or in the ancient world.

For example, Hesiod could very well realize a depletion of available levels of potassium and phosphorus and most definitely nitrogen for plant growth after a few years of farming without having added manure or some other form of organic material. Given that the *alfisol xeralf* soils can be compromised in the availability

[78] Sprent, 5. "Ammonium is the principal form of inorganic nitrogen in many undisturbed soils…the exchangeable ammonium continually replenishes that take from the soil solution by microorganisms and plants. Further losses from soil may occur due to leaching (generally small, because of the complexing with soil colloids) or due to volatilization (generally small, except under special, usually alkaline, conditions)."

of potassium within one to two years of cropping, the prospect of a crop failure seems probable. If Hesiod is indeed on his father's land, then it would be reasonable to expect that a few crops have already been produced on that land prior to the date of his dispute with Perses. The land would by the nature of the soil/plant relationship be showing serious signs of depletion in weak, spindly, yellowish crop stands without some supplement introduced into the soil. I am not suggesting for example that Hesiod would have known that if the soil pH happens to be acidic, the availability of phosphorus[79] for plant growth can be hindered by restricting the growth of the beneficial micro-organisms, thereby making successful farming nearly impossible unless remedial action is taken. Rather, I would expect Hesiod to know the soil is 'sweet or sour'[80] by tasting the soil, as it was taught to me, and to know when to tend to his soil and how and why, by the clues offered by each field as it lay fallow or in a crop, and for him to read the signatures of the 'troubled spots' within his field and relay his method of 'remedial action'. Yet, Hesiod is silent on any aspect of improving the soil through such techniques as cover crops or manuring. Was manuring of fields an unknown practice?

[79] E.A.Paul, 293. "Phosphorus solubility is complicated by common ion, ion association and pH effects and the amount of P absorbed on the surfaces of clay minerals….phosphorus availability to plants is linked to soil pH….acidity, below pH 6.5, increases the P tied up by Al and Fe….increasing alkalinity results in tie up by Ca." Alifsol xeralf soils are high in Al and Fe.

[80] The term 'sweet' soil refers to soil that is the proper pH for growing which the soils are generally neutral or slightly alkaloid, while the term 'sour' soil refers to acidic soils.

Manuring

Susan E. Alcock, John F. Cherry and Jack L. Davis address the issue of manuring in Ancient Greece[81], by analyzing what is commonly referred to as "manuring scatters" (Alcock et al. 144). Though the "scatters" represent "only *settlement-derived* fertiliser" and do not indicate "the total area farmed, or even the total manured area" the "scatters" offer evidence in the form of clay sherds and other debris of the practice of dumping wastes[82] rather than a systematic manuring regime (Alcock et al. 144). The authors, point out that manuring as a practice has to be "argued in detail *in its local context*" (Alcock et al. 144). They, point to the difficulty of incorporating manure into the soil, "in hot arid climates manures oxidise rapidly and easily lose their nutrients from excessive drying out or the leaching of the soluble constituents," consequently requiring the manure to be "immediately ploughed[83] under rather than spread on the surface" (Alcock et al. 144). The authors state, "no one would deny that the use of *kopros* was well known and approved in antiquity" (Alcock et al. 145), however, "the general scarcity of manure imposed constraints on farmers: manuring was not, and could not be, an indiscriminate process" (Alcock et al 156), though curiously, Hesiod seems unaware of manuring.

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[81] Susan E. Alcock, John F. Cherry and Jack L. Davis. "Intensive survey, agricultural practice and classical landscape of Greece," *Classical Greece: ancient histories and modern archaeologies*. Ian Morris, ed. (Cambridge: Cambridge University Press. 1994).

[82] Read E.J.Owens, *The Koprologoi at Athens in the Fifth and Fourth Centuries B.C.* Classical Quarterly 33 (I) 44-50 (1983).

[83] *Guide to farm practice in Saskatchewan*, 94. "Losses of nitrogen due to volatilization are very high during the first 2 to 4 days after application (up to 50 percent of the easily available forms). Therefore, it is essential that manure be incorporated immediately after application."

Manuring is certainly a labour intensive operation, which should have been a particular interest to Hesiod, yet he fails to even hint that the soil he claims to be farming requires some form of fertilising[84], particularly if the object is to fill one's storage jars (*Works and Days* 30) with ample amounts of produce. Is Hesiod's land[85] such that it falls under the Hesiodic definition of rich country, "who inhabit rich country" (*Works and Days* 385-390)? This may account for his lack of mentioning the use of soil supplements, even though, the rich country soil can still be depleted without supplements. The rich country may very well be flood plains rich with a yearly coat of fresh silts, which would seem to be an event worth mentioning. Hesiod's non-precise description leaves the idea as purely speculation.

[84] Alcock et al., 145 "Such fertilisation supplied necessary nutrients, improved the structure and aeration of the soil and – very important in the semi-aird Mediterranean – increased the amount of water the soil could retain."

[85] Hanson, 107. "The evidence in the poem instead suggests that the farm is on less than prized bottomland."

Chapter Two

There are other concerns with *Works and Days* pertaining to farming, which I will explore through the comparison of other farming texts. Although the texts in question were composed many centuries after Hesiod, I think they provide a sense of what is important to a farmer – what the farmer observes. I have included a non-Greco-Roman text for comparison. The texts show similar information and interests that appear to be closer to a farmer's concern than what *Works and Days* offers. The comparisons suggest a universal focus inherent with farmers, a focus on the soil and the climate.

Hesiod's silence on manure or supplementing his soil might suggest that manuring was not well understood in his day. There is, however, information on manure and manuring mentioned by the ancient Greek writers in their works such as Xenophon's *Oeconomics*, Theophrastus's *Enquiry into Plants* and Homer's inclusion of the dung heap outside of Odysseus' home. Manure and manuring also appears as a subject in the later Roman agriculturists texts (books), which may reflect their reading of Greek and North African agriculturists' treatises. Nutrient maintenance is a concern for any farmer in any culture and in

any time period. For example, I would like to point to an agricultural text from outside of the Greco-Roman world scribed in 100 B.C.E. in China, *Fan Shêng-Chih Shu.*[86] Despite the gulf of time and cultural differences this text points to the universality of the concern over soil fertility[87]. Furthermore, Fan's approach to nutrient infusion is so peculiar, I think it is important to examine the differences between Hesiod's lack of detail on soil fertility and the detail offered by the *Fan Shêng-Chih Shu* agricultural text. Equally, I think the similarities of the texts, one claimed as a farmer's assertion (*Works and Days*) the other an observer's cognizance (Fan), when compared reveals Hesiod as more of an observer than a farmer.

Fan Shêng-Chih

The author of the text "Fan Shêng-Chih" was an "eminent agriculturist of China…in the later half of the first century B.C.," however, "there has been found …no evidence on record to account for the years of birth and decease of Fan Shêng-Chih" (Fan 42). Hesiod is also a known name without solid evidence

[86] *On "Fan Shêng-Chih Shu" An Agriculturist Book of China Written By Fan Shêng-Chih in the First Century B.C.* Translated by Shih Shêng-Han (Peking: Science Press, 1974) 42-67. Shih Shêng-Han has included an "analytical survey of *Fan Shêng-Chih Shu*" that covers the history of the text and its author.

[87] For further information on ancient Chinese agriculture review: Joseph Needham, *Science and Civilisation in China,* vol. 6 Biology and Biological Technology, Part II: Agriculture by Francesca Bray. (Cambridge: Cambridge University Press. 1984)

to support the 'life' associated with the name.[88] Shêng-Han Shih, the translator and a *Fan Shêng-Chih Shu* scholar, suggests, it is a scholarly assumption that the "*Fan Shêng-Chih Shu* is actually a work of Fan Shêng-Chih the agriculturist," comprising his observations written down over two thousand years ago (Fan 44). Shih suggests that "all the matter recorded in" *Fan Shêng-Chih Shu* is not "Fan's own personal achievements"(Fan 45). It is pointed out that "what Fan actually did is, we believe, [was to] only (sic) register the accomplishments of the peasants" (Fan 45). Further, Shih states:

> …we do not take the book *Fan Shêng-Chih Shu* as representing the author's personal inventions or discoveries but rather as faithful reflections of the status of agriculture…whatever practice adopted then is such farming, and principles upon which those practices were based…are certainly the knowledge and experiences of past and contemporary working people. (Fan 45)

For Hesiodic scholarly research, Hesiod appears as a 'farmer' only because he promotes farming as a way of life and notably he seems to have an understanding of the regime of seasonal work. The knowledge he displays falls short of providing detail which when contrasted to the detail provided by Fan questions Hesiod's understanding of farming and his closeness to the subject. Shih's distancing the text from the actual hands-on-knowledge is clearly defining Fan as a scribe or scholar but not as a farmer. Fan's role is to listen and observe

[88] Snodgrass, *The Dark Age of Greece: An Archaeological Survey of the Eleventh to the Eight Centuries BC* (Edinburgh University Press, 1971), 4. "But when did he live? The answer of most recent scholarship is that he flourished after the end of what can reasonably be called the dark age; perhaps the most general point of agreement would be that he was alive in 700 BC, whether the greater part of his life extended before or after that date." M.L.West. *Hesiod Works and Days: Prolegomena and Commentary.* Oxford University Press, 1978. 30-31. "The date of his birth cannot be determined with any exactitude, but it must be considered unlikely that it was earlier than 750 or later than 720."

then report what he has learned from the farmers. The content of the *Fan Shêng-Chih Shu* then possibly represents the farmers' authentic experiences. For example, despite Fan's possible lack of practical hands-on-experience, he mentions manuring as a key element in knowing how to farm. He provides guidance in its use, and, like the Roman texts, Fan describes situations in which to use various manure or fertilising applications:

> In the spring, when the breath of the earth has not come through, the soil will be lumpy (when ploughed): it will be unable to retain moisture, and thus does not support the growth of crop plants for the whole year to come, unless (heavily) manured. (1.5)

and:

> When {sic} (hemp) plants grow to 1 ch'ih[89] high, manure with bombyxine[90] excrement at the rate of 3 sheng[91] per plant. Failing bombyxine excrement, use well ripened manure from pits instead. The rate is then 1 sheng per plant. (4.8.2)

and:

> To plant gourd: In the 3rd month, prepare 10 mou[92] of good fertile field, dig out shallow pits 1 ch' ih in diameter and deep, and 6 ch'ih apart. Pound the bottom with a club, so as to make it firm and waterproof. Place 1 tou[93] bombyxine excrement mixed with some compost into each pit, and sow 4 seeds thereupon. Then apply 2 sheng water. Water again where it dries up. (4.10)

In each application listed manure is applied to either aid in moisture retention and/or in the fertility of the soil. What is important is the attention paid to how to

[89] Shih. 1 ch'ih = 22cm.
[90] silk worm droppings.
[91] Shih. 1 sheng = 167ml.
[92] Shih. 1 mou = 5.078 acre
[93] Shih. 1 tou = 1.67 liters

use the manure in each situation; it demonstrates an attention to the soil/plant relationship, watching the signs of plant health.

Fan mentions various soil conditions, “hard heavy lands and black soils may be ploughed first” (Fan 1.3.1); which is a much more detailed instruction than Hesiod offers, “This is law of the plains, and of those who live near the sea, and who inhabit rich country, the glens and dingles far from the tossing sea, - strip to sow and strip to plough and strip to reap” (*Works and Days* 385-395). Hesiod is suggesting that all soil conditions are to be approached in the same manner which is in contrast to Fan’s identifying certain characteristics of different soils, and differences in approach, i.e., early ploughing or later ploughing.

Shih suggests that Fan possibly recorded a compilation of several methodologies applied in the same region, the middle Yellow River, suggesting perhaps that no one methodology of farming is universal in application other than perhaps the inclusion of manuring or fertilising and the seasonal demands. Also if indeed Fan has covered a broad area, he has gathered perhaps a consensus of sorts, which would suggest that attending to the soil’s fertility is inherent with being a farmer. Hesiod, by contrast, promotes a single, vague idea of the practice of farming[94] as the route to successful cropping.

[94] K.W. Belcher, M.M. Boehm and M.E. Fulton, *Agroecosystem sustainability: a system simulation model approach,* Agricultural Systems 79 (2004) 225-241. This research paper examined different soil zones in Saskatchewan, and compared the different farming methodologies employed on the land. “The results indicate that the economic and environmental sustainability of the system is dependent on the biophysical constraints which determine the management options that are technically, agronomically and economically viable” 225. Thus, the condition of the field, its soil fertility, the slope, the elevation, the exposure to sunlight, moisture content, closeness to markets, storage, etc. determine the methodology employed. With a variable terrain, the expected variability in methodologies as a variable “biophysical” would require are absent in Hesiod’s *Works and Days*.

There are further similarities between the *Fan Shêng-Chih Shu* and *Works and Days*, which are not related to the subject of farming. The similarity shared is in the manner in which the texts have come down to us. The fragments which make up the source of the two texts are arranged by scholarly research in what is thought to be the most logical or probable order. Also, the *Fan Shêng-Chih Shu* fragments, like the *Works and Days* fragments,[95] are compiled from several sources, dating from much later times, for example, the *Fan Shêng-Chih Shu* is reconstructed mainly from "6th century A.D." texts.[96] Like *Works and Days* the *Fan Shêng-Chih Shu* is a recaptured text.[97] There are similarities in the knowledge provided; both texts instruct a particular farming category – dry land agriculture (while different in some aspects and methodological approaches, the agriculture is defined as dry land farming).[98]

There are common sentiments expressed toward ideals, such as Hesiod's notion of hard work, doing certain tasks at the correct time of the season, obtaining an *oikos* complete with a wife, as the principles of farming. Fan lists the basic principles of farming as follows, "the basic principles of farming are:

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[95] M.L. West 1978, 75. "The *Theogony, Works and Days,* and *Shield* are together represented by fragments of fifty-four ancient manuscripts, all from Egypt: forty-five rolls dating from the first century B.C. to the fourth A.D., nine codices dating from the third to the sixth centuries A.D."

[96] Shih, 1.

[97] Shih, 42. "… it exists only as fragmentary quotations in some later books"; (see note 95).

[98] Shih, 42. "So far as we can discern, the fragments extant consist of directions on the system of dry-farming prevailing about 2,000 years ago in an arid district of the middle Yellow River region."

choose the right time, break the soil, see to its fertility and moisture, hoe early and harvest early" (Fan 1.1). A simplistic set of principles which none the less sum up a generalized understanding on farming, one that is partially shared by Hesiod (though missing the concern for fertility of the soil). Unlike Hesiod Fan does not involve agriculture with domestic relationships – marriage – or with the idea of establishing a 'home' or, for that matter, there is no concern with social community justice. This is not to say Fan's text is not an example of the product of a certain social structure, which was used in a manner that exercised a socially controlled sentiment.[99] In general, Fan's text is more concerned with agricultural ideas than with social structuring, which appears to be a concern for Hesiod. Hesiod does provide the same basic level of information, when to plough, to plant etc.; however, unlike the *Fan Shêng-Chih Shu*, which does make note of soil fertility, Hesiod avoids offering any opinion towards soil fertility other than as divine interventions:

> But they who give straight judgements to strangers
> and to men of the land, and go not aside from what is
> just, their city flourishes, and the people prosper in it:
> Peace, the nurse of children, is abroad in their land,
> and all-seeing Zeus never decrees cruel war against
> them. Neither famine nor disaster ever haunt men
> who do true justice; but light-heartedly they tend the
> fields which are all their care. The earth bears them
> victual in plenty, and on the mountains the oak bears
> acorns upon the top and bees in the midst. Their

[99] Shih, 46. "Shang Nung (farming as the most important), preaches that agriculture is a great affair and therefore best attention should be paid to it, - here for 'agriculture' both political administration and technological knowledge are meant. After thus developing in principle the paramount importance of agriculture, the remaining three chapters are dispensed to the technological side of land husbandry….The main thesis is: with good regard to the season and soil productivity, man can win good produce from the ground by his own effort through improvements in farming practices." (*Shang Nung* is the third chapter in the *Lü Shih Ch'un Ch'iu* an earlier text than *Fan Shêng-Chih Shu*) Hesiod argues that hard work, timing and piety are the main force in agricultural success and fails to mention soil fertility.

> woolly sheep are laden with fleeces; their women bear children like their parents. They flourish continually with good things, do not travel of ships, for the grain-giving earth bears them fruit. (*Works and Days* 225-250)

The *Fan Shêng-Chih Shu*, like *Works and Days*, provides practical knowledge[100] such as "never plough too early,"[101] or culturally infused knowledge which may not have much value as actual agricultural knowledge, such as "wheat is ill-suited with *su* days; barley with *tzu* days; nor can they be sown on *ch'u* days" (2.2). Hesiod has a list of days (*Works and Days* 765-805) in which the portents are either favourable or not for a variety of activities. For example, Hesiod states that a farmer should avoid "the thirteenth of the waxing month" (*Works and Days* 780-785) for seeding, which is not unlike the *Fan Shêng-Chih Shu*'s 'advice' of avoiding ill suited days.

Fan provides a detailed description on seed preparation, which Hesiod does not. The treatment of the seed prior to planting is not unlike the past modern agricultural practise of coating wheat seeds with mercury as a pesticide/ fungicide or the current practice of using "water soluble adhesives…to bind limestone, rock phosphate, or peat-based inoculate to seeds" (E.A. Paul 241). Fan provides the following recipe:

> Take equine bones, chop them finely. Measure out 1 shih [21.336kg.] and cook with 3 shih of water. Boil three times, drain and steep 5 aconite tubers in the decoction. Three or four days hence, take off the

[100] Shih, 45. "…what Fan actually did is, we believe, only to register the accomplishments of the peasants. In other words, we do not take the book *Fan Shêng-Chih Shu* as representing the author's personal inventions or discoveries but rather as faithful reflections of the status of agriculture in the middle Yellow River region at his time. Whatever practice adopted then in such farming, and principles upon which those practices were based as described in *Fan Shêng-Chih Shu* are certainly the knowledge and experiences of past and contemporary working people."

[101] Fan, Shêng-Chih Shu, 1.5.1.

> aconite tubers and stir in equal amount bombyxine and ovine excrements, stir well so as to form a thick paste. Twenty days before sowing, mix the seeds (with the paste) as if to prepare a wheat-kernel meal, - always do the mixing on a dry (sunny) day, so the treated seeds can be dried quick enough. Spread the treated seeds in thin layers and rake again and again to hasten drying…This treatment protects the crop from locust and other insect pests. (3.1)

It is difficult to determine what benefit such a practise would generate. There could be calcium from the bones, nitrogen from the manure, and whatever other properties the mixture might hold, but to what degree the amount present around each seed would aid in plant growth would require further research to determine an answer. This, none the less, represents a rather labour intensive practise in attempting to get nutrients (and pesticide) into the soil along with the seed.

In modern agriculture, the seed and fertilizer is often placed in the ground at the same time by the seeder; a disk seeder for example has two compartments or hoppers; one is filled with seed, the other with fertilizer. The seed and the fertilizer (often in small hail-size pellet form) are dropped mechanically into the furrow at the same time together. My point is the detail that is provided in the *Fan Shêng-Chih Shu* indicates a focus and understanding that nutrients are required to produce a healthy crop. This is demonstrated more clearly in 4.1.2 when it is stated that “on poor land for which means to manure are lacking” the sowing of “spiked millet” in a “mixture with excrement of polyvoltine silkworm”[102] is recommended. Though the excrement of the silkworm

[102] Dr. Roy Comments, 2007: The “use of silkworms excrements” reflects the availability of the excrement “in these areas where silkworm production has been important since the Han Dynasty which {is} contemporary to {the} Roman Empire.”

is not directly stated as being a fertilizer, it is compared to manure as a replacement that will improve the soil for growing. Even poor soil can be brought into production with the infusion of the "excrement of the silkworm"; suggesting that there is an understanding of what makes a poor soil – low nutrients. Suggestively, Fan appears to realize the role of fertilizers on crop yields.

Knowing the Land

Xeonophon, Theophrastus, Fan Shêng-Chih and the later Roman writers (Cato, Columella and Varro) pay attention to soil fertility, at least they mention fertility is an important component to successful farming. Xenophon does not hesitate to suggest that "the land never plays tricks, but reveals frankly and truthfully what she can and what she cannot do," [103] suggesting an understanding that there are variable growing conditions,[104] as there are variable nutrient levels of the soil. Theophrastus seems to provide a clearer understanding of the importance of soil fertility when he states:

> If a man should have regard to the kind of the seed and especially to the actual situation, considering the aspect in respect of winds and sun, as well as the soil itself, he would more properly gauge the differences. Similarly manuring for the sown crops should be done

[103] Xenophon *Memorabilia and Oeconomicus* Trans., E. C. Marchant (Cambridge: Harvard University Press. (1923) 1959). XX 12-18.

[104] C.Chang and C.W.Lindwall, *Effect of Long-term Minimum Tillage Practices on Some Physical Propeties of a Chernozemic Clay Loam,* Canadian Journal of Soil Science, January/February 1989; 443-449. 444 "In the literature, the effects of tillage on the soil physical properties are reported as being related to soil type, type of tillage equipment, tillage depth, soil conditions such as moisture content at the time of tillage, and climatic conditions. Therefore, the effects of tillage on soil physical properties should be determined at each location." Hesiod does not suggest alternative approaches to tillage, and puts forth a singular concern – to plough the land – but fails to indicate how the soil (tilth) should look once ploughed or if there was a variety of ploughing conditions directly related to soil types.

> with regard to the soil…from every point of view therefore the soil must be considered. (Theophrastus VIII, VI.2-5)[105]

Consideration of the soil is an essential element to farming, yet Hesiod seems unaware of this point. Particularly, when Hesiod distinguishes a variant in soil fertility:

> This is the law of the plains, and those who live near the sea, and who inhabit rich country, the glens and dingles far from the tossing sea. (*Works and Days* 385-390)

Hesiod mentions the "rich country" which presumably describes the capacity of the soil to produce healthy returns, although it also can be taken as a comment on the fertility of the soil. Therefore, labelling an area as "rich country" suggests that the opposite condition is present for other areas. At least, it would appear as though the lack of labelling the other areas implies that they have soils of lesser fertility than the "rich country." Hesiod does not reflect upon which area he is farming, either the rich country or one of the poorer soils. This is a rather curious omission (on Hesiod's part) for a farmer.

Compost as Fertilizer

Great human activities have been centred on gathering materials to supplement the soil to increase fertility and the out-put in yields. For example, "composting has been the traditional method of waste treatment in Asia," which has been generating a source of nutrients for agricultural uses for centuries; until

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[105] Theophrastus *Theophrastus Enquiry into Plants and Minor Works on Odours and Weather Signs*. Trans., Sir Arthus Hort (Cambridge: Harvard University Press {1926} 1977).

recently with the introduction of “chemical fertilizers,” it was the sole source of replacing nutrients.[106] The process of making compost involves activities that are as equally notable as ploughing a field. The fact that organic material was gathered, composted, then spread out on the fields indicates a focus that should be accepted as a concern for soil fertility.

In India “the production of compost …has involved a great deal of human labor,” an activity undertaken to ensure nutrient health of the productive soils.[107] For example, the research of P.J. Throne and J.C. Tanner[108] explores the nutrient cycling system of three (Java, Indonesia and Mid-Hills of Nepal) farming areas in Asia. The authors state:

> A key aspect of the integrated, mixed farming systems that are common in Asia, and indeed elsewhere, lies in the extent and nature of nutrient transfers amongst the different components of the farming system. At the most aggregated level, nutrients cycle from the soil to the crop and hence to the livestock that are managed within the farming system. Each of these system components can act as an entry point for nutrients and also as a modulator, affecting the dynamics of individual nutrient transfers within that component and, as is often ignored, in other system components. In smallholder mixed farm farming systems, the authors would argue that the most important factors determining the extent and nature of the role of a system component, as an entry point for or modular of nutrient flows, are related to management practices formulated in response to a diversity of livelihood objectives. (111-112)

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[106] E.A.Paul and F.E.Clark, *Soil Microbiology and Biochemistry*. (San Diego: Academic Press, 19), 281.

[107] E.A. Paul, 281.

[108] P.J.Throne and J.C.Tanner, *Livestock and nutrient cycling in crop-animal systems in Asia*. Agricultural Systems 71(2002) 111-126.

This suggests a situation to situation response demonstrated by the method of farming applied to obtain a specific end product, but does it demonstrate the farmer's understanding of soil fertility? Suggestively, the authors indicate that their research found that the farmers "identified three major categories of fertiliser, namely, inorganic, fresh manure and composted manure" and when asked to rate the three on a scale of 1 (low rating) to 10, composted manure was assigned "a score of seven, fresh manure two and inorganic fertilisers one" (Thorne 116). The preference for composted manure is expressed by the farmers' observation that "under their soil conditions, plant growth responses are greater with manure-based compost than" with the other two forms of fertilizer (Thorne 116). Notably, the farmers' have observed the responses in the soil crop relationship from their fertilising activities and farm accordingly. Even Homer places a dung heap (composting as it sits) within the milieu of the ancient world, but Hesiod never suggests he has a dung heap or relays a sense of knowing the value of composted manure or for that matter his soil condition.

Again, a focus on maintaining or increasing the nutrient level of the soil tends to be an idea that the farming community shares. Recently, even on modern North American farming operations, the use of manure as a nutrient supplement is being re-embraced as indicated in a recent article in the trade magazine, *Manure Manager*, a publication dedicated to manure handling. For Tim Graig, a North Carolina hog farmer, the use of manure is a cost saving activity. In the interview in which the reporter suggested that "having access to manure for fertilizer is a big bonus in an era of rising commercial fertilizer

prices,"[109] Tim Graig responded, "It's gone up and up and up" referring to the cost of commercial fertilizers, "…using the manure to grow the crop makes all the sense in the world."[110]

Soil Nutrient Returns

Getting nutrients into the soil is known globally by farmers and is a practise that is as much about farming as farming is about itself which can be seen as being inherent to the practice of growing plants. Even the Roman writers included "the beneficial effects of leguminous plants" as agricultural aids in maintaining soil fertility.[111] The same focus is echoed by the "Chinese authors [who] have written about the beneficial effects of the use of the water fern, *Azolla*, in rice culture" since at least "AD 540."[112] It appears that even in divergent cultures using even non-manure based nutrient resources, the focus or understanding of the importance of soil fertility is not an unknown factor in successful farming for the farmer and in some cases even amongst non-farmers. I should point out that these observations that report what tools or skilled workers are in use or what practises are applied to farming, rely on what already has been established by the farmers. The observations of the authors do not reflect

[109] Paul MacDonald, *Manure Manager* July/August 2006 Volume 4. No.4. "Setting up a custom separator." 25-27. 27.
[110] *Manure Manager*, July/August 2006, 27.
[111] E.A.Paul, 218.
[112] E.A.Paul, 218-219.

an agricultural 'knowledge' evolution[113] – they report the status quo as understood by the author. It should be understood then that these textual references to agriculture or rural life are not 'creating' or teaching individuals to be farmers who then farm according to the texts, rather the texts try to encapsulate the practice of real farmers.

Writing with an Athenian cultural background several centuries after Hesiod, Xenophon[114] states:

> …so, too, everyone will say that in agriculture there is nothing so good as manure, their eyes tell them that nature produces it. All know exactly how it is produced, and it is easy to get any amount of it; and yet, while some take care to have it collected, others care nothing about it. (XX.6-10)

Suggestively, this statement gives the impression that the practice of manuring in agriculture is known by 'everyone' and those who do not manure do so by choice. While there is not room in this paper for a more in-depth exploration of this statement, I would suggest the 'choice' to not manure may not be so much of a 'choice' as a reflection of one's social status, farming acumen,[115] or soil type. Access to manure is access to nutrients required in producing a healthy crop and a return from that crop. The lack of access to manure equals a lack of crop

[113] The information provided in the agricultural texts is information that is already in practice, and is not a new innovation in the agricultural practises such as Snodgrass views *Works and Days*, hence the practice has been arrived at through 'trial and error' of the local farmers responding to their local situation.

[114] Finley, 1981, 97. "Xenophon's manual for the gentleman farmer, the *Oeconomicus*, written about 375 BC."

[115] P.J. Throne and J.C. Tanner, 114. "Where manure husbandry is poor resulting in the loss of most of the nutrients voided by livestock (human waste in the Athenian situation; see note 82),… few of these nutrients will find their way to the soil."

successes in most cases. To suggest that a true farmer would ignore the benefits of manure[116] seems questionable, particularly if "everyone will say that in agriculture there is nothing as good as manure" (Xenophon XX.6-10).

Theophrastus

Soil is the medium a farmer relies on for cropping, consequently the soil's nutrient content determines in part the farmer's success. Theophrastus seems to be aware that the condition of the soil has a major influence on the farmer's ability to crop the land. As he suggests, "if a man should have regard to the kind of the seed and especially to the actual situation, considering the aspect in respect of winds and sun, as well as the soil itself, he would more properly gauge the differences" (Theophrastus VIII.v.4-VI.2). Theophrastus reports the phenomenon of soil variability, but mistrusts the explanations:

> …there is a saying that the same soil can take at one time more, at another less seed; and in general the former condition is taken as an unfavourable omen, for then they say at once that the soil is hungry; however this is perhaps a rather foolish saying. (VIII.v.4-VI.2)

What Theophrastus is reporting appears to be evidence of minimal nutrient levels in the soil after cropping (second year cropping – *soil can take at one time more*

[116] Diane Mettler, *Manure Manager* July/August 2006. "Dealing directly with manure issues." 28-31. 31. "The energy costs, and the costs of commercial fertilizer and diesel are a lot higher that they used to be. Now there's a lot of interest in hog manure. The value of the manure is so much greater that it was even three or four years ago." Hesiod's world is dependent on manure, the value of which to a farmer is perhaps understood in the above statement from Dale Vincent, an Iowa hog farmer.

[pre-depletion, i.e, first year crop], *at another less seed* [depleted]) therefore making the soil 'hungry' and incapable of being seeded heavily each year.[117] What he fails to observe is the nutrient availability is directly related to the rate of germination success (sprouted seed that 'takes' and grows to maturity). With poor nutrient levels the rate of successful maturing plants is limited, as reflected in the saying Theophrastus rejects "the soil is hungry." Hence, the soil is "hungry" for the material that infuses nutrients or the 'food' for the cycle, and in the ancient world it is manure, green manure or thrash (straw). (Certainly, the sense of crop loss is there, but also a symptom of deficiency is perhaps being mentioned which Theophrastus either realizes or is 'reporting,' like Fan, the farmer's experiences without truly understanding what he was observing, as suggested by the passage reviewed above.) I would suggest that a farmer, with more direct knowledge than Theophrastus, may well understand the concept of a 'hungry soil.' If Theophrastus misunderstood this information about soil variability, Hesiod completely ignores it. Evidently, Hesiod's *Works and Days* expounds a kind of knowledge that lacks a detailed farming context.

[117] *Fan Shêng-Chih Shu*. "If a field gave a poor crop in the second year, fallow it for one year."1.7. Leaving land in fallow to regenerate the fertility of the soil takes the land out of production; a potential loss of income. Even with grazing on the land, the nutrient content of the soil will still be compromised unless some form of fertilising beyond single year fallowing is applied. Fan mention's "inferior land, which must be fallowed for 2 consecutive years," (7.2.2) which demonstrates the minimal return of nutrients from fallowing the land.

Columella

A similar notion of 'hungry soils' is present in Virgil's (Roman poet 70 B.C.E. –19 A.D.) poem *Georgics,*[118] "crops of flax burn out a field, oats burn it through, and drowsy poppies soaked in oblivious sleep will burn it too: but still, rotation makes labor easy, as long as you are not ashamed to drench the arid soil with fertile dung, and scatter grimy ashes through the worn-out land" (Virgil 1.59 – 1.100). "The worn-out land" is 'hungry' for the proper nutrients after having been cropped and in Virgil's example, he has added ash, which is a source of potassium. Infusing manure to improve soil fertility is also found in the writings of the Roman agriculturists Cato, Columella and Varro. Even though arguably at least two of these writers[119] it appears never farmed, they still provide the notion of manure as a contributing factor in producing a healthy crop.

Columella suggests that Hesiod is one of the first writers to give attention to the farming arts:

> There is, furthermore, a great throng of Greeks who give instruction on husbandry; and the first of them, that most renowned poet, Hesiod of Boeotia, has contributed in no small degree to our art. (Columella 1.1.5-8)

Columella praises Hesiod for leading the way, contributing "in no small degree to our art" (Columella 1.1.5-8). What is clear is that Columella is mentioning Hesiod as a known name,[120] someone his readers will be aware of, suggesting that

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[118] Smith Palmer Bovie translation of Virgil's *Georgics*, University of Chicago Press, 1956.
[119] Columella and Varro.
[120] Columella 1.1. 5-8. "that most renowned poet, Hesiod of Boeotia, has contributed in no small degree to our art."

Works and Days is known in the upper echelons of Roman society. Why is a farmer's poem about farming so popular with the elite? Certainly, it would be surprising to see the elite admiring the poetry of the lower class, particularly that of the farmers. After all, farmers are far too busy Columella suggests to be bothered with:

> The inquiry into these and similar questions concerns those who search into the hidden secrets of nature rather than husbandmen. They are subjects more agreeable to students of literature, who can read at their leisure, than to farmers who are busy folk, seeing that they are no assistance to them in their work or in the increase of their substance. (Columella IX.11. 1-3 to IX 4-111.1)

Of course the irony is that those most likely to be accessing Columella's works are the *students of literature*, quite possibly the sons of the elite. Further, Columella states at the beginning of his treatises on agricultural that:

> …one who would profess to be a master of this science must have a shrewd insight into the works of nature; he must not be ignorant of the variations of latitude, that he may have ascertained what is suitable to every region and what is incompatible…These matters I cannot believe that any man can know beforehand without the light of intelligence and without the most accurate instruction. (Columella I, preface 21-24)

Columella seems to be suggesting that to know the means and ways of agriculture is to "have shrewd insight into the works of nature" which according to Columella can only be achieved by "those who search into the hidden secrets of nature rather than husbandmen." So farmers do not know how to farm, only those who have "accurate instruction," i.e., Columella's work.

Yet, Columella later on states:

> I cannot, therefore, sufficiently express my surprise, as I justly complained at the beginning of my treatise, at the fact that, while instructors can be found in the other arts which are less necessary for life, for agriculture neither pupils nor teachers have been discovered. (Columella XI.I 9-12)

However, Columella refers to Hesiod as "that most renowned poet" who was "the first of them" to give "instruction on husbandry." He does not suggest that Hesiod was a farmer. Rather, it appears as though Columella is claiming that instructing in husbandry is not the same as being a farmer. There appears to be a separation between being a working farmer and perhaps a gentleman-landowner[121] that assumes the role or title of farmer but lacks the actual knowledge that a farmer may use. Columella appears to suggest that textual instructions on husbandry are not instruction manuals on farming – *nor teachers have been discovered*. Indeed, Columella states, "Athens assuredly has been the mother of a host of writers," (Columella I.I.5-8) and Columella includes Hesiod within that host of Greeks. His concern is about writing not farming for he points to "Euphronius of Amphipolis (who is himself regarded as a praiseworthy farmer)" to single him out as the only writer identified as a farmer. Hesiod is not

[121] Lene Moller Madsen and Hanne Kristine Adriansen, "Understanding the use of rural space: the need for multi-methods"*, The Journal of Rural Studies* 20 (2004). Though based on modern agricultural situations the authors provide a system of classification to identify landowners based on the landowners' level of involvement with the production of agricultural products. The authors offer a typology*: "Agricultural producers* are production-oriented and their attachment to agriculture is high… *Non-agricultural producers* are production-oriented but do not have a high attachment to agriculture… *Soft farmers* have a high attachment to agriculture at the same time their reasoning behind afforestation is nature-oriented… *Countryside residents* are nature-oriented and have only a minor attachment to productive agriculture… *Amenity residents* are attached to the countryside through the amenity value of their farm. They are nature-oriented and have no attachment to agriculture at all." 494 In only two categories is the identity of the groups labelled as 'farmers' - *Agricultural producers; Soft farmers* – all others are defined as landholders. These two groups are noted as being more intimately involved with their land holdings. Something of a similar scale can perhaps be applied to the ancient world, helping define active farmers from landowners.

given the title of “praiseworthy farmer,” he is honoured for his theme – agriculture (or is it?) (Columella I.I.8-12). For example, Columella states, “we may endow Agriculture at last with Roman citizenship (for it has belonged so far to writers of the Greek race)” - and not the farmers apparently (Columella 1.1.8-12). Further, it appears that Columella is more concerned with style than with content, “Julius Graecinus, has taken care that two volumes of similar instructions on vineyards, composed in a more elegant and learned style, should be handed down to posterity” (Columella I.I.12-15). Even when he is presented with evidence that there is a problem with the content of “the Punic writers from Africa” texts on agriculture, which were apparently handed “down in large numbers, yet many of them are assailed as erroneous by our farmers” he is unconcerned (Columella I.I.5-8). Perhaps these texts are specific to North Africa and/or they too are an exercise in elegantly written language more so than a farming manual.

Indeed, Columella references Tremelius, someone he defines as a farmer, “who, though he brings this very charge,” that the information provided in the texts is not applicable, ”provides the excuse that the soil and the climate of Italy and of Africa, being of a different nature, cannot produce the same results” (Columella I.I.5-8), hence, farming knowledge is area specific. This comment suggests an understanding that soil and climate are key factors in agriculture, and further that these factors can affect a crop’s outcome. However, Columella is not concerned whether the context is of value to the Roman farmer, he is more focused on the style or form of the treatise. Yet, the information that is provided

by Columella[122] is far more extensive than Hesiod's and more closely akin to the level of information Fan supposedly recorded. At the very least Columella identifies a key element in farming as observation in the following statement:

> For it behooves a careful householder to go around every little bit of his land quite frequently and at every season of the year, that he may the more intelligently observe the nature of the soil, whether in foliage and grass or in ripened crops, and that he may not be ignorant of what may properly be done on it. (Columella I.I.18-II.2)

This is encouragement to know the fields in a more intimate way, not unlike the Japanese farmers recalling the areas in their fields requiring supplement (I am not suggesting they were accurate with each placement, it is the act or attention to the fertility that is of interest). A farmer has to know the field by knowing the soil and to know the soil the farmer has to recognize the health of the crop. Hesiod does not seem to focus on this key relationship: soil and crop health. It appears that for Columella, writing about agriculture can be a stylistic focus of sorts, a literary form, which he awards Hesiod as the first among them to write in the 'agricultural' genre.[123] Columella recognises Hesiod as a poet, like himself a learned man of literary expression, therefore Columella is able to accept Hesiod's

[122] Barker and Gilbertson, Columella mentions soils types, and identifies the suitable crops for each type as an important aspect to farming, Hesiod does not. "The other main environmental component in the decision making was in all likelihood the nature of the soils. We tested the soil classification of the Roman agronomist Columella, which is based on ease of tilling rather than fertility, by comparing it with the results of a semantic analysis, in Pliny the Elder's *De Re Agraria*, of all associations between a word for soil, the adjectives accorded to it, and the plants mentioned as favouring this soil (341)."

[123] Columella 1.1.5-8. "There is, furthermore, a great throng of Greeks who give instruction on husbandry; and the first of them, that most renowned poet, Hesiod of Boeotia, has contributed in no small degree to our art."

poem as a literary piece, further he does not indicate an expectation of the poem other than it being an example of a particular poetic form.

There are other issues with Columella's work that might help shed light on Hesiod, such as the issue of Columella's source of agricultural knowledge; from where did he extract his information? He suggests that a bailiff[124] is required to farm properly. The bailiff occupies an intermediary position between landowner and farm labourer. So Columella, for all his 'practical' experience, may still be somewhat removed from the muck, the barns, and the seeds. Columella uses metaphors that link Roman state life with the rural life, for example, Columella writes, "like soldiers marching to some battle, with vigour and eagerness of mind" (XI.I. 14-18) to describe agricultural workers, possibly slaves, heading to the fields to work. There appears to be a social undercurrent, which I suggest is part of the purpose of the treatise more than revealing actual practical farming *technē*. I suggest this because Columella indicates that:

> …you will find very many masters of parts of it (sic - agricultural knowledge), with whose help you can form the perfect bailiff. For a good ploughman can be found and an excellent digger or mower, and likewise a forester and vine-dresser, also a farrier and a good shepherd, no one of whom would refuse to impart to one desirous of learning them the principles of his art. (Columella XI.I. 12-14)

[124] Columella XI.I.12-14. "Therefore, when he who is to take up the duties of a bailiff."

Therefore, it appears that Columella recommends reliance on agricultural practitioners'[125] knowledge rather than promoting his own treatise as a source of that knowledge. He claims that there are no teachers or students of agricultural knowledge apart from the individuals directly involved in running the farm and yet he is able to provide a resemblance of agriculture knowledge; but to what end has he penned his treatise?

Columella perhaps is dealing more with a social-philosophical point of view than practical farming knowledge. This is perhaps best demonstrated by the research[126] in the UK on the issue of 'measuring' the public's perception of agriculture (and the reforming of governmental supports). Much of the "reform discussion seems to make the unstated assumption that vibrant traditional agriculture is itself a valued public good" (Hall et al. 213). The assumption of a "traditional agriculture" I suggest, constructs the rural area fictively or artistically like 'pastoral painting' rather than regarding it as a place of food production. Indeed, the research suggests that the public, when questioned on where public monies should be spent in the rural area, focused more on environmental protection and enhancement than on food production. For example, in one survey held by the Royal Society for the Protection of Birds, respondents were asked where government spending should be concentrated in the rural area; 46% were in favour of paying farmers to protect the wildlife and the environment

[125] Hesiod also is reliant on outside expertise – "Athena's handymen has fixed in the share-beam and fastened it to the pole with dowels" and "let a brisk fellow of forty years follow them (oxen team)." *Works and Days* 425-440.

[126] Clare Hall, Alistair McVittie, Dominic Moran, "What does the public want from agriculture and the countryside? A review of evidence and methods*," Journal of Rural Studies* 20 (2004): 211-225.

and only 32% felt the funds should used to pay farmers to produce food (Hall et al. 215). Granted, the interests of this particular group would weight their preference. My point, however, is that the rural area is viewed traditionally as both an area of food production (under a particular methodology noted as 'traditional') and a romanticized pastoral landscape for the urbanite to enjoy. Neither position necessarily comes from the farming community. Yet, the urbanite's outlook and preference may have influence over the viability of the farming community.[127] Therefore, agriculture defined by the urban sphere, is defined according to the urban community's perceived 'wants' of the rural area, and not necessarily in relationship to the reality of the 'needs' of the farmer. Is Hesiod also engaging in presenting an (urban) social-philosophical point of view[128] rather than imparting practical farming knowledge? As it is, Hesiod also involves outside help, such as a ploughman and a slave woman, suggesting reliance on outside expertise. Is the Hesiodic farmer expounding an urban observation rather than providing actual knowledge of farming? If so, would his character take on a much deeper function than a persona? Does the character of 'Hesiod' appear more than a farmer/poet, and possibly as a symbol?

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[127] Robert Parker, *Athenian Religion: A History* (Oxford: Clarendon Press, 1996). 47 "The celebration of the 'pre-ploughing festival' (*Proerosia*) was 'proclaimed' in the fourth century, even though it in fact took place on a fixed day. This flexibility is obviously appropriate, both practically and symbolically, when working farmers performed the rites. But when such festivals are taken up by the city, the association with immediate agricultural realities is liable to be loosened." In other words the urban sphere can control the interpretation (definition of farmer is expressed in the rural festivals generated within the rural community) of the rural sphere, thus control the social construct of 'farmer'.

[128] Hall et al., 218. "The 'farming as a way of life' finding is consistent with results from previous polls that suggest farming is a part of a cultural landscape."

More Than a Farming Manual

The Riddle of the Sphinx, printed in 1890, and written by then lecturer of the National Farmer's Alliance in the United States, N.B. Ashby, provides an example in the first chapter titled, "Agriculture-its antiquity and honor" when Hesiod's *Works and Days* is mentioned in the following manner:

> …Greece had an agricultural poet in Hesiod, who was the author of an epic called "Works and Days," in which an account is given of the habits and superstitions of the rural classes, and shrewd instruction is given on practical agriculture. The popularity of this book among the Greeks indicates that it was true to the customs of Greek life. The poem intimates that it was the custom to employ hired help upon the farm…there was a large class called freemen, who doubtless constituted what we now term the people, or great middle-class. (Ashby 17-18)

Hesiod employs outside knowledge to accomplish his task of farming. The source he pulls from, according to Ashby, are the "freemen" and not slaves, though Hesiod does mention slaves active in agriculture, "a slave woman and not a wife, to follow the oxen as well" (*Works and Days* 405). It appears then that Hesiod is not only writing about agriculture, according to Ashby, but also about promoting a middle-class who are noted as "freemen." Hanson also read the poem as supportive of the point-of-view of a middle-class (middling farmers). In a sense, Hesiod becomes the symbol of the 'common' man eking out his living through hard work and strong ethics. Yet, this surely is reading into the text (*Works and Days*) a notion that is rooted in the American mythos, a socio-political-philosophical perspective not perhaps inherent to Greek thought. Ashby and Hanson may be confusing Hesiod's work ethic with the more modern

Protestant work ethic and through that similarity both scholars view Hesiod as actively promoting a middle-class. The notion of a middle-class seems to have been generated out of the so-called 'Protestant work ethic' of the Industrial Revolution and not something inherently Greek. To be sure, the idea of the farming class as the 'backbone' of the nation is clearly indicated by Ashby's dedication, "The author respectfully dedicates this book to the American Farmer, with whom rests the welfare of the republic" (Ashby preface). There is something within Hesiod's poem that is beyond simple agricultural instructions and a peek into daily life of the ancient Greeks.

M.L. West

The role of the farmer, and by this I mean the actual practitioner, seems to be partially presented by Hesiod in his attention to the seasonal concerns. Equally, however, it seems important to Hesiod to include the ages of man, a fable, and the myth of Pandora, which have very little to do with farming. This seemingly disjointed focus has brought the attention of scholars to it, such as M.L. West:

> To anyone who expects an orderly and systematic progression of ideas, it is liable to appear a bewildering text. The same themes recur several times in different places, connections between neighbouring sections are often difficult to grasp, trains of thought are interrupted by seemingly irrelevant remarks, the didactic intention is here and there suspended in favour of pure description; and taken as a whole, the variety of contents is so great that it is hardly possible to describe the subject of the poem in a single phrase. (M.L. West 1978, 41)

What is expected from the poem? It is after all presented as a one-way conversation. I would suggest that the rambling nature of the discourse is more akin to natural speaking patterns, something that would aid in the development of the characterisation of the Hesiodic farmer as a realistic character (or the rambling nature of the poem reflects the fragmentary condition of the poem as we have it today). To have the character restricted to uttering highly stylized moments of speech which in effect are expounding the poetic structuring in the form of a conversation, confines the character to predictable dialogues and poetic purposes. M.L. West suggests that there is difficulty in identifying a singular thematic element in *Works and Days*, which is challenged by Marsilio, Clay and Edwards who promote the idea of a singular focus but do not agree on what that focus is. This thesis suggests that the poem creates 'Hesiod the farmer' as a believable character able to preach the life style that produces a 'just' community. This character who takes authority from a kind of 'down home' farming wisdom holds the epic together.

Just City

Hesiod does not seem to promote the farmers as the 'backbone' of Greek culture; rather he suggests that the farming life is the means of stability as suggested by his description of the 'just' city, "they flourish continually with good things, and do not travel on ships, for the grain-giving earth bears them fruit," and this is only possible through piety which begets more productive farming (*Works*

and Days 235). Hesiod argues that a stable community has to be 'just' to be so, and if the community is 'just,' the agriculture will be good. Agriculture is the result of a stable community, Hesiod seems to suggest, and not the other way around. In other words agriculture does not create a civil society, a civil society creates good agriculture by pleasing the gods. Within the stable community agriculture is presented as a means of avoiding going to sea, therefore agriculture, a result of the 'just' city, is a stabilising factor in the Hesiodic community. He does not suggest that farming is necessarily the route to prosperity for a community but rather that it is a reward in the 'just' city, "light-heartedly they tend the fields which are all their care" and that the people "flourish continually with good things, and do not travel on ships, for the grain-giving earth bears them fruit" (*Works and Days* 230-5). It sounds like an echo of the Golden Age, when everything was provided:

> …they had all good things; for the fruitful earth
> unforced bare them fruit abundantly and without stint.
> They dwelt in ease and peace upon their lands with
> many good things, rich in flocks and loved by the
> blessed gods. (*Works and Days* 115-120)

Consequently, the 'good life' can only exist if the community is pious, and being so makes the food production effortless. The reality of farming in a sense is ignored and passed off into the divine realm where soil fertility is linked to divine allowances for piety. The piety is generated supposedly from the 'just' community and the farmers are a part of that community rather than a separate stratum "who do true justice" and bring about the favour of the gods (*Works and Days* 230). This is a call for absolute conformity, for it only takes one person to

cause the wrath of Zeus, “often even a whole city suffers for a bad man who sins and devises presumptuous deeds” (*Works and Days* 240). Therefore, everyone in the community is tied to being ‘just’ in what ever they may be doing. Practically speaking, however, being ‘just’ does not bring about fertility in the soil, unless “doing justice” includes spreading manure. The notion that social behaviour causes soil fertility seems to suggest a refusal to acknowledge the importance of nutrients (manure, green manure and thrash) in farming.

Kopros in the Odyssey

Manure or *kopros* (Greek) certainly appears in the literary works, for example in the *Odyssey*[129] (17.295-300) of Homer, a contemporary of Hesiod’s, who is not writing about farming. Homer creates a scene in which Odysseus’ dog lies on the dung heap:

> …a dog was lying there raised his head and ears.
> This was Argos, patient-hearted Odysseus’ dog... But
> now he had been put aside, with his master absent,
> and lay on the deep pile of dung. (XVII 290-295)

and at the moment he recognizes his master he expires:

> But the doom of dark death now closed over the dog,
> Argos, when after nineteen years had gone by, he
> had seen Odysseus. (XVII 325)

[129] Homer, *The Odyssey of Homer*. Trans., Richmond Lattimore (New York: Harper & Row, 1965)

I would suggest that Homer has included what appears to be the 'earmarks' of a farmer:[130] a farm dog, dung pile, beasts of burden (mules and oxen), and manuring fields. Therefore, the importance of the dung heap within the scene is to express a staid condition, a tension between what should be (Odysseus at home for the past nineteen years) and what currently is (the suitors consuming his 'storage'); the narration seems to indicate the dung heap like Argos awaits its master:

> …but now he had been put aside, with his master absent, and lay on the deep pile of dung, from the mules and oxen, which lay abundant before the gates, so that the servants of Odysseus could take it to his great estate, for manuring. (XVII 295-300)

It is important to note that the manure is collected, possibly composted, and then taken to the fields to be spread out. Is there a system at work where the servants carry the manure out to the fields after the dung heap has reached a certain size or is composted to a certain point, with instructions of where to place it? I suggest that the dung heap serves more of a purpose than being a backdrop to emphasise the sorry state of Odysseus' holdings – Argos is assigned to the refuse pile. I suggest there is a sense of control and ownership is involved with the dung heap – Argos "lay on the deep pile of dung," warm no doubt, but also he is a guard dog and like the 'Chekhovian gun' indicates a literary value beyond the obvious. The concern here is that Odysseus' identity, in

[130] I note here that Homer in both epics the *Iliad* and the *Odyssey* evokes farming motifs with greater detail than Hesiod. I believe that there is an argument for the farming life being presented in Homer's epics. The choice that Achilles makes, his shield and Odysseus visit to him in the underworld, where Achilles laments his choice, are highly suggestive. The *Odyssey* in particular, I believe, emphasises a focus on farming and stability. With further research I hope to either prove or disprove my suspicions.

part, is revealed to be that of a farmer – he owns the dung heap, the dog, and the mules and oxen and the servants/slaves and has a wife and an *oikos* – as proscribed by Hesiod. Does Odysseus also decide where best to spread the manure and when, like a farmer would?

Snodgrass

Hesiod does not relay any sense of a farmer having to pay attention to manuring. It could be suggested that Hesiod does not mention manuring because it is such a common practise that he is not required to mention it. If manuring was simply a common practice, which therefore did not warrant attention, the same rationale could be applied to ploughing or harvesting which are equally as common practices. This is particularly problematic for Snodgrass' thesis that sees Hesiod as "an arable farmer through and through, he instructs his audience from the basic first principles onwards"[131] but neglects to mention the most important element in farming – nutrient return into the soil. Further, if Hesiod is creating a reflection of his community, then why is his community void of dung? For the later writers on agriculture the agricultural world is as closely linked to manure as is the ability to produce a healthy crop. Hesiod's silence, in light of his goal of surplus harvests,[132] is an awkward omission not to be

[131] Snodgrass, *The Dark Age of Greece,* 379.

[132] Graeme Barker, *The Archaeology of Drylands,* 57. "… the Mediterranean economy itself should be seen as flexible strategy, fluctuating between emphasis on cash crops and subsistence staples, depending on the historical and economic contexts. Within the Mediterranean zone, during periods of social collapse, the complex shifts towards subsistence mode, whereas during times of economic prosperity, cash crops play a larger role." It would appear that Hesiod is in a period of flux, where obtaining surplus, i.e., cash crops, seems to be the focus and the hope of leaving poverty behind (subsistence mode).

explained away as an activity too common to mention.[133] Particularly if:

> The very energy of Hesiod's advocacy suggests that in about 700 BC Greeks still needed exhortation and elementary instruction in arable-farming. (Snodgrass 1971, 379)

It appears that soil fertility for Snodgrass is not included in what he determines to be an "elementary instruction" or for that matter the notion of a furtherance of knowledge - "onwards" (Snodgrass 1971, 379). Is it that Hesiod's only real concern is to generate an image of 'farmer' set within a *mise en scène* to support the image of a 'farmer' that his audience will find believable? Is *Works and Days* really about farming and who is Hesiod's audience?[134]

As Finley points out (see note 134), there is more than one type of farmer. I want to turn attention to the role of the community drawn in *Works and Days* to the kind of farmer who speaks in the poem. Further, what is not revealed, such as manuring, may suggest clues to the nature of the audience to which Hesiod addressed his poem. The actual passages that involve farming do not make up

[133]Paul MacDonald, *Manure Manager* May/June 2006 Volume 4. No.3. Modern attention to manure is perhaps reflective of the ancient world in that it is a source of nutrient. Recently, this July 27 2006 in Flower, Michigan a trade show the "Great Lakes Manure Handling Expo: Keeping manure in the Zone"(16) highlights the renewed interest in manure as a nutrient source. Natalie Rector, a manure and nutrient management field specialist with Michigan State University states: "we're focusing on the application methods that place manure in the root zone and keep it in the root zone….you can apply it or inject it, but the key is keeping it in that zone. We want the farmer to get maximum value they can from all the nutrients in that manure ." 16 The attention is on the nutrient content of the manure being applied with the most effective means. If manure is the only source of nutrients, then it would seem likely that attention is paid to manure, be it on a modern farm or a Hesiodic farm, manure would be a focus for the farmer.

[134] Finley, *Economy and Society in Ancient Greece,* 5. Finley points to the differences in the farming class, "although they distinguished between gentle-farmers, living in town, and working farmers in the countryside, that was a distinction between men of leisure, who were alone capable of the good life, and men who worked for their livelihood…the working farmer ranked higher on the scale than the artisan, but that was a matter of morality." Perhaps, Hesiod's audience is not the working farmer as much as it might be the gentlemen-farmers or the men of leisure.

the bulk of the piece. Other issues, such as justice, take more of the poet's attention.

Hanson

Hanson brings into the debate the idea that is expressed so often in Greek literature of an association to a people's social and personal behaviour with climate. Hanson cites the Hippocratic corpus, which associates the hostility of the land (climate) with a social personality, "by nature keen and eager to work, headstrong, self-willed and prone to fierceness, rather than to timidity" (Hanson 135). The Hippocratic corpus is perhaps best thought of as philosophical generalisations rather than medical treatises. The above description is of course a positive comment on living a harsh existence, as the Greeks did, and suggests that 'soft' living begets inferior beings, i.e., non-Greeks. The corpus is cultural-social propaganda in some measure, which promotes the Greek life style as the 'healthy' life style. Do we read Hesiod's poem with this in mind and therefore come away viewing Hesiod even more as a stereotyped image serving some yet undetermined end? The *mise en scène* supports the notion that Hesiod is a 'farmer'; the description of Ascra as "a miserable hamlet, Ascra, which is bad in winter, sultry in summer, and no good at no time," supports the notion that Hesiod is facing a grim existence but one that is preferred over having nothing at all. Maria Marsilio offers an interpretation of this description that goes beyond supporting a stereotyped character (*Works and Days* 635-640).

Marsilio

Marsilio reads Hesiod's observation of his community's (possibly his farm's) environment as a symbolic representation of his father being "denied…poetic skill" by the Muses of Helicon (39). This idea suggests a far more complex construction of character and consequently the *mise en scène* is all that more involved in creating Hesiod's persona. To accept Marsilio's argument which involves identifying certain passages of the poem by the language used – Aeolic – as evidence of a demonstrated ability of the poet to control the language to elicit certain responses in his audience, means to accept Hesiod as an accomplished poet and not a novice. It also implies that his audience was familiar with a variety of Greek dialects; perhaps they were men of leisure or sea traders. In this situation the poet is promoting poets and poetry.[135] The wretched conditions Hesiod describes are an analogy for the lack of poetic inspiration and skill,[136] and not about the climate. If indeed lines 135 - 140 of *Works and Days* are a poetic imagery for the lack of poetic inspiration, the image of 'farmer' becomes entangled in the image of a 'poet.' Therefore, the elements of the *mise en scène* are also entangled in defining Hesiod as a farmer poet. The effect of Marsilio's argument, it should be noted, is to make Hesiod one of the educated gentry, a landowner perhaps, but not a practical farmer.

[135] Tandy, 1997, 206. "Ralph Rosen has ingeniously proposed that Hesiod's discussion of sailing at *Works and Days* 618-94 should not be taken literally but is intended as a metaphor for poetry and as an argument explaining that he writes Hesiodic poetry, not Homeric (epic) poetry."

[136] Marsilio, 38-39.

Clay

Not all scholars address Hesiod's description of the environment within the poem whether it is his farm or not. Clay does not seem to question or make special notice of Hesiod's grumbling over the weather conditions.[137] Clay enters the poem from such a different point of view the issue of Hesiod's commentary does not arise in a direct manner at least. Clay does not engage in debating whether the comment on Ascra is fictive or not; she accepts the description as merely echoing 'real life'[138] and it is therefore not required to be precise. Hesiod's comment on the climate of Ascra is instead viewed as establishing the rigours of terrestrial life as a harsh reality separate from the blessed life of the gods.[139]

Does Hesiod's comment on the climate add to the sense of character or does it add to the sense of 'place'? The answer, I think, is yes to both inquiries. The comment establishes a tonal reference to Hesiod, how he perceives the world of nature, and the world of his community. Additionally, the comment sets the sense of place, though there is debate as to where that 'place' might be, it still establishes a place in which Hesiod resides, that being "a miserable hamlet," possibly a farm (perhaps the *oikos* is in Ascra). Therefore, I suggest that the comment's purpose is two-fold: to establish the persona of a grumpy

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[137] Clay, 181. "…his father, whether real or fictive, crossed the seas to miserable Ascra, so that his son might encounter the Muses at the foot of Helicon."

[138] Clay, 182. "By constructing his *Theogony* and his *Works and Days* as complementary visions of the cosmos, Hesiod reveals his ambition to encompass the whole that embraces the harsh realities of human life as well as the lovely songs of the Muses that make it bearable."

[139] Clay, 166. "Throughout this study, I have argued that the *Theogony* and the *Works and Days* must be interpreted together, each complementing the other, in order to form a unified whole embracing the divine and human cosmos."

villager/farmer and secondly to establish the persona within a setting, creating a 'place' in which the character's 'life' is exposed.

Literary Concerns

I would like to look now at how 'place' is established through Hesiod's description of life in and about Ascra. Particularly, I wish to examine the creation of the sense of 'place' established through Hesiod's description of farming life. First I will look at the Hesiodic list of 'must have' things he suggests that a farmer requires to be productive. How obtaining a house, a ploughman, oxen, a slave woman, an assortment of tools including two ploughs and a wagon, with possibly a ship and at some point a wife, equates to being a farmer is perhaps best answered in understanding the construction of the community within the poem. Hesiod throughout the poem identifies specialisation within the population, such as potters, craftsmen, poets, carpenters, blacksmiths, ploughmen, judges, slaves and I will include the beggars in this list, as did Hesiod. There is some structural sense of a hamlet as men gather in the blacksmith's shop on cold wintry days to converse (*Works and Days* 490-495). We obtain this information through Hesiod's descriptions. Hesiod's description of Ascra as a "miserable hamlet…no good at no time" suggests a crusty villager/farmer like that found in Menander's *Dyskolos* who appears anti-urbanite if not anti-community and is definitely conservative. What can be made of the image of 'farmer' in *Works and Days?*

There is a general assumption that the image of the world around Hesiod is an actual depiction of ancient rural life in Greece or holds reflections of that life.

M.L. West and others such as Tandy even go further by claiming Hesiod is the voice of the peasantry.[140] Their assumption is based in part on the imagery used to generate the *mise en scène*. Snodgrass incorporates Hesiodic imagery to accent the archaeological evidence and to add an interpretative process that includes using *Works and Days* as a source of knowledge. There is a potential problem in referencing Hesiodic imagery as if it were a window into the world of 700 B.C.E., it ignores the possibility that the imagery is stereotyped, even allegorical, traditional, perhaps rather than specific to any period or age, or an adaptation, or that it has been arranged to frame the character of Hesiod within.

Hesiod, though familiar with sophisticated control over language, i.e., his reputed creations *Theogony* and *Works and Days*, is depicted as a farmer by the imagery that surrounds his narrative voice. M.L. West agonized over trying to explain the source of this poet's words, even suggesting that Hesiod the poet had simply copied or borrowed from Near-Eastern wisdom poems[141] using standard story forms and themes.[142] However, Clay indicates, "none of West's examples, it should be noted, depicts a relationship exactly parallel to that of Hesiod and his brother" (Clay 5). Therefore, it appears that a certain element of creativity has

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[140] Tandy, 1997. Tandy refers to Paul Millett and suggests that Millett "successfully argues that Hesiod fits clearly into the mold of the peasant, thus silencing recent and not-so-recent efforts to make him something else". 205

[141] P. Walcot, *Hesiod and the Near East* (Cardiff: University of Wales, 1966), 95. "The type of agriculture practised in the East differs from that to be found in Greece to an appreciable extent, and this difference is reflected by the two calendars." Babylonian *Counsels of Wisdom* and Hesiod's *Works and Days*.

[142] Tandy, 1997, 206. "Even if Martin and Rosen are essentially right that Hesiod takes on a particular persona or poetic character, this does not mean, for example in Martin's case, that the details of Hesiod's outsiderness are not in fact true." If indeed Hesiod is using eastern wisdom poetry, as suggested by West, rearranged and altered how can the images within then reflect the world of Ascra, and further then be considered 'true'? If indeed there is a outsiderness to Hesiod's persona it is only in his supposed family history, but apparently not in cultural customs which clearly would indicate his outsiderness.

been applied beyond a traditional story frame. Clay suggests, "the peculiarly Hesiodic character of composition may lie not so much in the materials themselves as in Hesiod's structuring and manipulation of traditional material and in the specificity of the situation presented, whether fictive or not, between the speaker and his addressee" (5).

The creative shift between *Theogony* and *Works and Days* has been traditionally identified as a move "from the more 'traditional' *Theogony*," which suggests a standard retelling of community known stories "to the more 'individualistic' *Works and Days*" (5) which suggests a new story is being developed.[143] Assuming a new story is being developed which in part reflects something of its particular audience and author, an awareness of how the imagery is generated may reveal more than its literary function.

Scholars have noted the creative shift in terms of a social revolutionary development, which is defined by Clay as "a scheme" that "fits into a larger interpretative pattern, long dominant in the study of Greek poetry and still influential, detailing the 'discovery of the mind' or the 'rise of the individual' during the archaic period" (Clay 5). This suggests, then, that Hesiod the poet is composing a poem that is responsive to the changing social realisations. Snodgrass argues that the social change is brought about through the introduction of arable farming methodologies, which were unknown previously,

[143] Finley, 1981, 128-129. "A wholly new social situation emerged, in which not only some of the components were different from anything known before but also the relationships and spread among them, and the thinking. We may not be able to trace the process but we can mark its first literary statement beyond any doubt, in the long poem, the Works and Days, in which Hesiod, an independent Boeotian landowner of the seventh century BC, presumed freely to criticise his betters, the 'gift-devouring princes' with their 'crooked judgements'."

and which are then reflected in Hesiod's rudimentary grasp of farming *technē*. We are given two possibilities to explain the seemingly individualistic nature of *Works and Days*; a social change that identifies the self (individualism) and a social change brought about by a technological advancement in agriculture. Neither of these positions explains Hesiod the poet's control of language and the sophisticated construction of the character Hesiod the presumed 'farmer'. Not to mention the specialisation of labour and technological sophistication revealed in the poem.

To assume that 'Hesiod the poet' and 'Hesiod the farmer' are the same person is to not explain how a farmer in a tiny village arrives at a skilled level of composition if he is busy farming. A 'farmer' who is depicted as too busy to bother with the more urban centre and views such involvement as idleness, somehow creates a poem whose audience would be in that urban sphere, and not the busy farmers. The poem establishes that a farmer is too busy for the 'goings on' of the urban sphere, which includes the idleness of poetry composing and recitals (*Works and Days* 25-30). Poets and beggars share a similar value in the social fabric as Hesiod the poet develops these values within the *mise en scène*. Does the placement of beggars and poets (in that order) within the same line (*Works and Days* 25) suggest that Hesiod the poet is defining poetry like begging as an idleness, or perhaps as a result of idleness one is forced to either beg or create poetry to survive. Or is it perhaps as Marsilio suggests that Hesiod is promoting the life of a poet to be as virtuous as the life of a farmer, as opposed to the life of begging brought about from the lack of learned skills, i.e., farming or

poetry composition. If we accept this premise as a possibility then perhaps the rudimentary level of knowledge depicted in relationship to farming is explainable as well as the rather sophisticated level of poetry. If indeed Hesiod is self-promoting his skills as a poet and uses farming as an allegory, his ignorance of farming in *Works and Days* is less problematic. To suggest the opposite, that his knowledge of poetry composition is rudimentary and he uses poetry as an allegory for farming, the argument falls apart quickly. Hesiod's skill as a poet is obvious, whereas his farming knowledge is not at the same level of sophistication.

For someone who professes the urgency of accepting his depiction of the proper life, allegedly farming, Hesiod supplies little tangible information about practical farming, his ostensible subject. Granted, to the novice the advice given appears to be infused with farming knowledge, which in part is true, but the personal practical details are missing.

Farming Knowledge

I would like to look briefly at the research of Jasper Eshuis and Marian Stuiver *Learning in context through conflict and alignment: Farmers and scientists in search of sustainable agriculture* which offers insight into the farming 'perspective'. Granted, this research is dealing with a modern situation (2005), however, there still is information on how farmers view farmers that may be illuminating for the present thesis.

Eshuis and Stuiver view the process of “learning” as involving “story-lines” which are generated from “social reality” in the guise of “metaphors, analogies or clichés” (139). Further, the “story-line can be seen as simplified accounts of complex discourses, often packaged as “one-liners” that sound “right” (139). Certainly, Hesiod’s *Works and Days* contains metaphors, analogies, clichés and one-liners that sound right for the novice of farming, but I would suggest the same material would sound too generalized to a practising farmer. The reason I suggest this is that from my own experiences I understand farming to be a much more personalized involvement with the land – knowing its capabilities. This sentiment is echoed in Eshuis and Stuiver’s research as noted by a farmer’s comment who was involved in the research, “with the experimentation of methods, I cannot copy the methods of my neighbour, as he has other cows, other grassland, and other manure” (141). Consequently, “one-liners” (139) will not provide information that truly reflects the ‘on-the-ground’ experiences of the ancient or modern farmer. The process of learning to farm is a process of “learned” knowledge “from specific situations, through observation and comparison” (141). Hence, “instead of learning from universally valid formulas,” such as Hesiod seems to offer, the art of farming is very much a personalized and localized practise (141).

The idea of farming as a personalized and localized practise is an important element to examine. Xenophon notes, “the land never plays tricks, but reveals frankly and truthfully what she can and what she cannot do” followed by the observation “and when men farm the same kind of land, some are poverty-

stricken and declare that they are ruined by farming, and others do well with the farm and have all they want in abundance" (*Oeconomics* XX 12-18). Clearly, there is an element of personal choices and decisions being made in relationship to the soil. Significantly the notion of differing levels of farming know-how, understanding of the land which "never plays tricks," begets success. To do otherwise ensures failure, "some are poverty-stricken" (*Oeconomics* XX 12-18). A similar sentiment is expressed by Mary Keil, a local farmer, when she states, "each field is like a person, it has its own personality, and a farmer has to get to know that personality before they can farm the field."[144] Even the Roman writer and statesmen Cato writes, "If you ask me what is the best kind of farm, I should say, a hundred iugera[145] of land, comprising all sorts of soils" (Cato 1.1-7). Cato suggests, "all sorts of soils." Cato lists the agricultural 'types' of usage expected from various soils:

> A vineyard comes first if it produces bountifully wine of a good quality; second, a watered garden; third, an osier-bed; fourth, an oliveyard; fifth, a meadow; sixth, grain land; seventh, a wood lot; eighth, an arbustum; ninth, a mast grove. (Cato 1. 7-11. 3)

[144] Conversation with Mary while cleaning out her chicken barn, May 2006. Jacqueline R. Smith. "One-on-one with Peter Mondavi Jr.: Big-time wine maker gets hip to organic farming." September 2007 Issue 352. 60. "…you have to be much closer to the vines, which is more labour intensive. If even a small problem gets a foothold of your crop, you'd better jump on it immediately." A farmer must pay attention to all 'signs' of change, to do so the farmer must have an idea of what appears healthy and what that does not. More importantly the farmer has to respond according to the problem with the correct solution, suggesting an intimate level of knowledge, hence Mary's and Mondavi Jr's comments.

[145] "A iugerum is approximately two-thirds of an acre." W.D. Hooper and H.B Ash, *Cato and Varro on Agriculture* (Loeb Classic Library), 4.

While Mary likens the soil to a personality, ultimately, what is grown on the soil defines the soil's vitality, as suggested by Cato's list and his comment to seek "land comprising all sorts of soils." How does Cato know what soil type will support which crop he has planted without knowing or having an idea of the expected performance? The sentiment expressed by Mary about getting to know the field (soil) like a personality speaks directly from the farming experience. Yet, Hesiod provides nothing of the character of the soils he is growing on, providing few clues to the type of farming method that would best suit his soils.

This shortcoming is a major problem in identifying *Works and Days* as a 'farmer's poem'. Rather what is strongest within the poem is its composition and within that composition the development of the persona of the Hesiodic farmer. One of the weakest elements in the poem, based on line counts, is the farming knowledge (118 to 204 lines out of 828 lines relate directly or indirectly to agriculture). The nautical knowledge, as suggested by Hesiod, is of a simpler understanding than the farming knowledge, i.e., he does not instruct on how to sail. The woodworking knowledge is more sophisticated than the farming or the nautical knowledge, which is puzzling, but is explained by M.L. West as being "a common pattern" found in poetic structuring (1978, 53).

Why does a poet who professes to be revealing the need to farm give more attention to woodworking, as M.L. West has noticed, (based on 44 lines dedicated to the subject of woodworking)[146] than any other *technē*? M.L. West, in an almost innocent way, suggested, "on the subject of woodcutting the poet has some quite technical knowledge to impart; one might almost think he was more of an expert on this than on anything else he deals with" (1978 53). How does the knowledge of woodworking add to the character of Hesiod? What would an audience member think of Hesiod's attention to woodworking? To suggest that woodworking is something a farmer would have to know is perverse. Shipwrights, wagon and furniture makers arguably need it more. Why provide more and better information on woodworking than ploughing? The purpose does not seem to be clear, for Hesiod does not suggest that Perses enter into woodworking as an occupation, so why does he include such detail on the subject?

There are, however, problems with Hesiod's woodworking knowledge, according to Marsilio. While Hesiod does provide "specific instructions regarding the types of wood to be used for the various parts of the farmer's plow in 427-436" and knows the terms for the parts of not just a plough but also a wagon, he is in part reliant on "Athena's handmen" (Works and Days 425-430) (a carpenter) to assemble the plough (Marsilio 16). His knowledge of woodworking falls short

[146] West 1978, 53. "414-57 Woodcutting and other preparations (44 lines); 458-92 Ploughing (35 lines); 493-563 Winter lull (71 lines); 564-70 Pruning vines (7 lines); 571-81 Harvest (11 lines); 582-96 Summer lull (15 lines); 597-608 Threshing, etc. (12 lines); 609-17 Vintage and conclusion (9 lines)." There is a possibility that there are lines missing from the poem. The fragmentary condition of the poem and the sources of the fragments often many centuries apart brings into question the completeness of the *Works and Days* that we read today, is it the poem that Hesiod wrote?

of a carpenter's but offers a rather particular attention to detail on woodworking (woodcutting[147]) that is not shared with any other *technē* Hesiod 'instructs' his audience on (Marsilio 17). If indeed, Hesiod is imparting knowledge of farming as suggested by Hanson, Tandy, Snodgrass and others, then the absence of soil maintenance set against the detail regarding woodworking must question the alleged centrality of the 'farming knowledge' to the purpose of the poem.

Even more curious is the attention to the winter lull (71 lines see note 146) relative to truly practical farming knowledge, such as harvesting which is given a mere 11 lines. Hesiod does not within those 11 lines give a clear method of determining when to reap. On a modern grain farm a moisture meter is employed to ensure the grain is dry enough to put into storage. If the grain has higher moisture content than 14% there is a risk of the grain rotting or fermenting in storage.[148] Prior to moisture meters the farmer would chew the grain to determine if it had low enough moisture content which was determined by the crunch, taste and texture of the chewed grain. Unripe grain has a slightly sweet to mild bitter taste and is mushy to slightly pasty (grain sugars have not converted). While ripe grain cracks with an audible crunching sound and has a chalky texture with a slight nutty flavour (grain sugars converted to starch). Certainly, this is an acquired sense, which is only possible to learn from demonstration, and not unlike sensing when to seed.

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[147] Hesiod does not offer information on the actual cutting of the wood, though he implies what cuts are to be made; hence, I have chosen to replace woodcutting with woodworking to more accurately reflect the information provided (I have experience in woodcutting as well as woodworking and I apply this knowledge in this reasoning).

[148] *Guide to Farm Practice in Saskatchewan*, 56.

I think the issue of weighting the information provided by Hesiod is an important issue, one that I will now address from the point of view of the *mise en scène*. What support does the collective information with in the poem provide in generating a sense of character (Hesiodic farmer) and place (Hesiod's farm)? Is there another purpose for supplying information not necessarily about farming? One plausible explanation is that Hesiod the poet is demonstrating his acumen with several subject matters such as: woodworking, poetry, the *oikos*, justice, piety, customs, mores, farming, sailing, trading, weather, community, gods, history (personal and community mythologies), women, marriage, and family dynamics. The overall message perhaps is that Hesiod is stating that he is able to discern the several layers of his society by means of describing the physical aspects of each layer.

For example, Hesiod mentions the use of a "slave woman" to help plough and seed the land; she is not described in personalized physical terms (*Works and Days* 405 -409). She is required to be "not with child." Otherwise Hesiod's interest in her is confined to her ability to perform labour. She is expected to assist in the ploughing and seeding, which Hesiod does not provide the detail of precisely what the slave woman would be doing in the field. Equally as vague is what would be expected of her in establishing Hesiod's *oikos*. The slave woman is an element in the poem, a part of the *mise en scène* Hesiod is creating. With the same sort of detachment he shows in his description of the plough, he describes the slave woman, both are elements of farming, tools of the 'trade'.

Though, his detachment may reflect a social attitude towards slaves, it may also indicate a distancing from any actual involvement in either aspect of farming.

The poem supposedly demonstrates Hesiod's familiarity of rural life. Hesiod does not provide detail regarding how the slave woman is to assist in the field other than "follow the oxen" (*Works and Days* 405-409). This is an important point to make as the weight of success is very much dependent upon the actions of the slave woman, yet Hesiod does not describe her tasks in detail. How does a farmer then know if he is getting a 'return' on his investment in a slave, if he does not know what they do explicitly; how can he tell if the work that is being done is effective and appropriate without this understanding? Hesiod certainly provides no guidance in slave management. He seems to rely on the slave woman to possess this very specified knowledge. Since he can mention the slave woman within the context of farming and domestic life, it seems to be assumed that he knows what it is she will be doing. Yet, Hesiod does not provide a working scheme for the slave woman; what sort of farm (and *oikos)* is she helping to establish in Hesiod's formula of success?

Even the description of making the plough includes "Athena's handmen" whose contribution is more clearly defined; yet, the operation of the plough is left to a hired ploughman.[149] Hesiod does not provide tips that involve a level of hands-on knowledge regarding ploughing, i.e., in controlling the plough with animal/s pulling it. There is no advice on how to keep the plough at a certain

[149] Michael H. Jameson, Curtis N. Runnels, Tjeerd H. van Andel, *A Greek countryside : the southern Argolid from prehistory to the present day,* 388. "A man with oxen and a wooden plow could plow 3 stremmata (3,000m2 or 0.3ha) a day….with half the land in fallow the 13.5-ha properties would require some 22.5 man-days of plowing at a critical time of year."

depth within a variety of soil conditions (compacted, loose, sandy, rocky, etc.) or plough straight or even contour ploughing considering the terrain around Ascra. The finer details are completely missing, suggesting a distance between the poet and farming life. Marsilio's point of view challenges this notion as she states, "Hesiod's farmer relies largely upon his own judgement and skill in completing his preliminary tasks" (Marsilio 16). Yet, there is no incident in which Hesiod instils a sense of his "own judgement" in deciding which farming task – he does not for instance suggest a specific area in which he has found holm-oak, he uses only generalisations, "look out on the mountain or in the field for one of holm-oak" (*Works and Days* 425-430).

There are no personalized moments brought into the poem that relay a sense of Hesiod as personally involved in any practical activity regarding farming. His knowledge of woodworking appears to be more detailed, yet incomplete and we do not know how he gained this knowledge. It appears, therefore, that Hesiod is generating an impression of knowing without demonstrating the actual knowledge. He provides only generalized images which again suggests a focused intent on generating a *mise en scène* that supports a stereotyped character; the 'farmer poet' with a sense of 'place'.

Why I argue for seeing 'Hesiod the farmer' as a stereotype[150] is in part based on the omission of any personalized references to his farming experiences; such as the moment his father taught him how to determine when

[150] Hanson, 107. "From now on throughout Greek literature, the farmer is to be a man of leather and hides, and one proud of his distinct weather-beaten look." In other words the Hesiodic farmer becomes the image from which other images of farmer are generated out of, not unlike the character of Knemon the farmer in the Menander's *The Dyskolos*.

to seed. By this I mean that Hesiod's farming knowledge does not contain personalized information or insights; he relays no situations that he has resolved or dealt with as a farming issue, and perhaps the one place from which he could gain more insight on farming he shuns – the blacksmith's shop. Hesiod gathers his fellow farmers in the warmth of the blacksmith's fires in the depths of winter:

> Pass by the smithy and its crowded lounge in winter time when the cold keeps men from field work, - for then an industrious man can greatly prosper his house - lest bitter winter catch you helpless and poor and you chafe a swollen foot with a shrunk hand. The idle man who waits on empty hope…who lolls at ease while he has no sure livelihood. (*Works and Days* 490-495)

Hesiod appears to chastise them for being 'idle,' which is an interesting reaction and one that I would suggest is ignorant of what is taking place in the blacksmith's shop. Notably, an observation and conclusion from Eshuis and Stuiver's research suggests, "knowledge stemming from sources such as theoretical models, rules of thumb, or the experiences of academics and farmers, has to be interpreted and fitted to the local situation," therefore the blacksmith shop offers a venue of exchange of experiences and learning for the farmers that is "fitted to the local situation" (143).

In my own experience it was the local café or tractor dealer's shop where farmers would meet while in town to talk about their farming experiences. My meeting of the farmers in Japan evolved from being a visitor with their urban friends to a shared commonality, despite the language barrier. Once they learned of my past farming experience the conversation became focused on their

own farming experiences.[151] It was made clear that their knowledge of farming was passed down by oral and hands-on demonstrations usually supplied by a father or grandfather or uncle or even neighbours. Each farmer I met was taught by the means of oral tradition, as was I. Hesiod views those who are in the "crowded" smithy as non-industrious, yet if they were gathering information which would aid their endeavours, the notion of being 'idle' seems misplaced and perhaps instead speaks of a level of ignorance, if not arrogance, on Hesiod's part (*Works and Days* 490-495). Is Hesiod really a farmer? He views the gathering of his fellow farmers as idleness, but what better time than the winter to recite his poem, in the lull of the season when his fellow farmers would have more time to be entertained by the poem. Hesiod's disdain for his fellow farmers seems to stem from a perspective that does not understand the farming community, one that may well be on the outside looking in. At the very least, Hesiod seems to reject his supposed audience – suggesting a distance between Hesiod and the true farmers.

Hesiod is constructing a division within the descriptions of life in Ascra. A division of those who work hard (possible because they have no choice) and those who are wealthy enough to pursue each other's riches or are impoverished (beggars are the end result of idleness). The division is part of the *mise en scène* which I suggest places a higher value on Hesiod's point of view over the supposed point of view of Perses. So that the issue of weighting the information

[151] Conversations with farmers from various areas of Japan via friends November 2006, community farmers, re-turned farmer, 8th generation farmer, and newly taught farmer, each farmer was several kilometres apart and up to 1200 kilometres apart, thus representing a variety of soil and climate conditions they faced in farming.

within the *mise en scène* is expressed through Hesiod's valuing system of what is 'just' and what is 'unjust' (wrong). Each element of the *mise en scène* is set within one of the two perspectives, so that the sense of place is not only a physical sense but also an emotional sense of place in conflict.[152] If, as I stated earlier, Hesiod transcends this society's social layers it does not mean he truly understands the issues facing each layer, particularly those of farmers. Hesiod certainly seems to be aware of the potential tensions that a stratified community can bring - he mentions the wrangling of the courts where men vie for another's wealth –- and places those tensions within the *mise en scène*. But, it still does not necessarily make the tensions[153] presented those of the farmer (*Works and Days* 25-35).

Having set the emotional sense of 'place' as in conflict, be it the weather as already described to be wretched, or the scraping by with the meagre earnings from year to year cropping, or sea trading, or arguing with Perses, a sense of conflict is embedded within the *mise en scène*. The conflict in part is expressed as two kinds of Strife; one is a negative (blameworthy), the other a positive (kinder to men), suggesting that conflict is a part of life (*Works and Days* 25-35). Therefore, for Hesiod's character to seem real he must be faced with

[152] Edwards, 7. "I do not deny the thematic centrality to *Works and Days* of the opposition of village and city….but my position nevertheless will be that the organizing contrast is rather that of the poor with the prosperous and that this is entirely enclosed within the limits of the village."

[153] Clay, 166. "As I have argued, the god's vision of the cosmos does not correspond to the human viewpoint; and likewise, from the vantage of mankind, the gods look very different. That tension, I would maintain, constitutes the core of Hesiodic vision." Also, that tension creates a 'drive' or 'beat' to the poem, giving it a sense of life which is identifiable to the audience. The point being made is that conflict or tension with in the poem generates a sense of reality surrounding the character – the character is placed within a common human existence; a state of conflict.

conflict within the *mise en scène* or else he becomes mythological like the men of the Golden Age – free of conflict, but surreal or like the heroes of Homer – supernatural but overwrought with conflict. Hesiod the character needs a more 'earthy' presence, a more human-like presence to be successful as a personable character. By extension the *mise en scène* also gains a more human-scaled presence, particularly in the passages on farming, when presented through the Hesiodic farmer's eyes. What is missing is a sense of conflict that a true farmer would experience trying to farm. True, Hesiod does reveal the pitfalls of farming to some degree but fails to provide some of the more pressing issues in farming, such as the fertility of the soil and the maintenance of the soil. This is something that Hesiod would be struggling with if indeed his land were as marginal as his description would suggest.

Instead of reading Hesiod as a "peasant" farmer or a "middling farmer" or just as a 'farmer,' *Works and Days* should be read as the development of character dealing with more earthly matters, which begets the sense of the 'common man'. The character of Hesiod is a well-constructed entity, which indeed has a life of its own. M.L. West envisioned Hesiod spending "his boyhood playing round the village, herding animals and generally helping on the farm, and frequently walking the five or six kilometres down to Thespiae" (M.L. West 1978, 31). M.L. West draws this envisioned childhood for Hesiod based on the purposed life style reflected in archaeological records, yet he feels compelled to situate Hesiod within the context of a farming background to give credibility to Hesiod's image of farmer. M.L. West does not question whether the information

on agriculture is useful or not, even when the knowledge falls short, the scholarly work fills in the gaps, making rational explanations for such drops in knowledge. Yet, in all the scholarly works that I engaged not one focused on the lack of attention to the soil, again the paramount element in farming.

To accept Hesiod as a 'farmer' is to accept an image of farmer rather than a true farmer as the source of farming knowledge in the poem. Hesiod's mastery in creating a believable characterisation is reflected in the scholarly works that accept his persona as a 'true farmer'. Created from the motifs of farming (approximately one quarter of poem's lines constructs or supports the image of farmer with farming motifs), I suggest that Hesiod's farmer speaks of a mastery in character creation more than with an actual 'voice' of an ancient farmer. True, the trappings of farming life are there to some degree, but the surface treatment of farming relays a lack of actual farming knowledge. There are no personalized pieces of information which would be the means of communicating farming *technē* for the ancient Greek farmer as it is true today for the modern farmer.

Conclusion

If we accept that Hesiod, the poet of *Works and Days*, is not a farmer, how does knowing this change the analysis of *Works and Days*? Given that Hesiod does not provide direct evidence of having farmed by providing personalized pieces of information, and that Hesiod's offerings on agriculture are comprised of very little detail, and that the farming knowledge in total is but a small contribution to the overall piece, the poem and character must have another purpose rather than to provide a 'window' on (ancient) Greek farming life or to lay claim to part-ownership of a farm.

Sheila Murnaghan[154] states it is "now widely accepted that Hesiod's account of himself is shaped by poetic concerns rather than autobiography" (101). She further states:

> Hesiod…takes on the role of an apparent outsider ([sic] as that of a farmer looking in at the urban elite world of the courts) who is a true insider, and who is capable of speaking with particular authority to those in power. (Murnaghan 101)

[154] Sheila Murnaghan, "Farming, Authority, and Truth-Telling in the Greek Tradition," *City, Countryside, and the Spatial Organization of Value in Classical Antiquity.* Ralph M. Rosen and Ineke Sluiter, eds. (Leiden: Brill, 2006).

In Murnaghan's view the Hesiodic farmer's voice is a mere masking. It appears that Hesiod is an elite, speaking to the elite. This may help explain Hesiod's displeasure with the "idleness" in the blacksmith's shop[155] during the winter months; he is seeing the farmers from an elitist understanding – the farmers should be working all the time to be productive. With the farmers' production come surpluses that become tradable goods which tend to benefit the urban centres more than the rural. Hesiod is not therefore promoting farming; hence, "Hesiod's avowed preference for farming over sailing as a means of livelihood serves as a metaphor for the poet's choice of agricultural didactic over heroic epic" (Murnaghan 103-104). This appears to be similar to Marsilio's analysis of *Works and Days*, at least as far as reading the poem as a metaphorical piece promoting poetry and the life of a poet as a virtue. Evidently, scholars now find some serious problems in the identification of Hesiod as a 'farmer'. To have reached this conclusion suggests that there are problems with the level of the information offered by Hesiod on the subject of farming, bringing into question the use of the farming motif.

If indeed the farming motif is being used as a poetic device, then there should be a reasonable expectation of a difference between actual farming knowledge applied in a practical application and the illusion of farming knowledge applied as a poetic device. If the farming motif is a poetic device, then the expectation of the information is not for it to teach farming but to construct perhaps a metaphor or allegory, therefore the importance is focused on creating an illusion and not on farming. Accepting *Works and Days* as a metaphorical or

[155] See page 111.

allegorical piece is to accept Marsilio's, Clay's and Murnaghan's analysis. What is important is the view that the knowledge of farming is not about farming directly but rather it is about creating the illusions of farming knowledge. Hesiod did not therefore need to have farmed to compose the poem; he merely had to relay 'signs' of farming, or woodworking or sailing, to generate the illusion of knowing.

Hesiod further develops a voice of authority on the subject matter of rural life through the illusion of the Hesiodic farmer 'knowing' agricultural 'truths'. Certainly, the notion that Hesiod is a literary force, "…that most renowned poet, Hesiod of Boeotia, has contributed in no small degree to our art," (Columella 1.1. 5-8) as suggested by Columella's praise of Hesiod's command of the agricultural motif, is being suggested by Marsilio, Clay and Murnaghan's research. If indeed the Hesiodic farmer is a poetic vehicle, the believability of the character then serves the purpose of the poem and not necessarily the purpose of promoting farming knowledge. I believe this is an indicator of the split in knowledge: the private, intimate knowledge and community-based knowledge. The character has to be I would suggest a stereotype for the community-based image of 'farmer' to appear true to the audience and importantly to a larger audience beyond the localized sphere. The broadness of the Hesiodic farmer's subject range suggests a character that appeals to a more worldly audience than perhaps a group of busy local farmers. The avoidance of mentioning the more

detailed requirements of farming such as manuring or plough handling makes the poem an 'entertainment' piece rather than a cry of the peasantry.[156]

I think it is important to note that the Hesiodic image of farmer is one that has won widespread acceptance. If indeed farming is interpreted by the urban sphere as part of the "cultural landscape" (Hall 218) then there should be an expectation of the image of farmer being presented (and accepted) as controlled by this perspective. The Hesiodic image of farmer seems to agree with the urban interpretation of farmer and in doing so offers little to the practical farmers in knowledge. If the Hesiodic image of 'farmer' is not a didactic device, then to what purpose does the image serve?

M.L. West suggested that Hesiod 'borrowed' the agricultural motif from Near-Eastern wisdom poetry. If so, the farming 'instructions' for the Near-East and Greece are different due to the physical reality of the environmental differences between Greece and the Near-East as it is between Rome and North Africa. According to P. Walcot's research on the Sumerian text, "the Instructions of Ninurta, the son of Enil," a farming almanac, the information provided is not from a "simple farmer who composed his almanac of work on the farm" but from a "professor at a Sumerian school" (Walcot 95), which is not unlike Fan's text. Yet, Walcot points out that a 'difference' between the *Works and Days* and the

[156] E.F. Beall, "The Plow that Broke the Plain Epic Tradition: Hesiod Works and Days," vv.414-503, *Classical Antiquity,* Volume 23, (2004), 1. "…while a nineteenth-century critic would say that the poem itself is intended as advice for the early Greek farmer, containing 'maxims' on plowing simply because that activity was part of such a person's life, the twentieth century brought with it more thoughtful views of the opus. The twenty-first would be a good time to dispense altogether with claims that it is nothing but instruction."

Sumerian poem “is reflected by the two calendars,” (Walcot 95) a variable in the instructions on farming at least in the timing of activities.

The point here is that Hesiod could not directly use the same calendar or chain of activities related to farming as laid out in the Sumerian text. The differences in the advice offered by the texts suggest that Hesiod does have an understanding to some degree of his local agriculture. Indeed, “the type of agriculture practised in the East differs from that to be found in Greece to an appreciable extent” (Walcot 95). Arguably, the agriculture of the Near-East, Yellow River Valley, Boeotia or modern Saskatchewan, all share a similarity – they practise dryland farming. Again, I suggest that the purpose of *Works and Days* is not to *teach* agriculture, but to *suggest* agriculture. I am not suggesting that Hesiod’s instructions are ‘valueless’ in understanding farming; they are “obvious pieces of advice” (Walcot 95) to give credence to the farmer’s ‘voice’. Hesiod’s farmer is “stating the obvious, repeating facts that it would be open to anyone to figure out or confirm for himself” (Murnaghan 104), which leaves Hesiod to sound like a farmer, albeit a stereotype. Although, he presents himself as a ‘farmer’ the finer details of a farming life are absent. Thus, the borrowed motif of farming is used as a poetic device. It is not directly concerned with farming but with creating the Hesiodic ‘voice’ as a poetic vehicle. Within the confines of the *mise-en-scène* the Hesiodic farmer becomes the authority on farming. Perses offers no challenges to Hesiod’s farming advice, consequently the ‘voice’ of the Hesiodic farmer becomes the authority much by default and not through providing actual farming content.

Columella holds that farmers are too busy to be bothered with his treatises.[157] The praise Columella awards Hesiod as one of the first to use the farming motif suggests that the composition is not necessarily for a rural audience. Further suggesting that the imagery and substance of the poem would satisfy an urban audience. The rural audience would not have the time to spend listening to Hesiod or Columella recite their works, according to Columella. Clearly, there is an elitism being highlighted, the practical knowledge of the specifics of farming is being used to demonstrate a form of authority through 'knowing' but the 'knowledge' displayed lacks the specificity that would impress a real farmer. Why then do we believe that Hesiod is a farmer? Although he seems to claim the persona of a 'farmer,' he does not provide evidence of direct familiarity with the farmers' 'life'. While some scholars consider *Works and Days* to be an ancient farming manual, the absence of personalized experiences suggests that the poem is not about farming. Hesiod starts his poem stating that he will "tell of true things" (*Works and Days* 10), then launches into his concerns clothed in mythological referencing, leading into the mythology of the ages of man which includes the Pandora myth, then the parable of the hawk, concerns for justice, a tale of two cities, an indignant rant at the corrupt elite, justice again,

[157] Columella IX.11.4-111.1. "… the inquiry into these and similar questions concerns those who search into the hidden secrets of nature rather than husbandmen. They are subjects more agreeable to students of literature, who can read at their leisure, than to farmers who are busy folk, seeing that they are no assistance to them in their work or in the increase of their substance."

goodness and badness, reasons for work, and 300 lines into the poem the farming 'advice' begins. As mentioned, the farming advice is sparse, lacks the characteristic of a farmer's personalized experience. In summary, it is generalized to such a degree that an observer could have composed the information. What gives Hesiod's voice authority is the claim that what he states is from Zeus[158] via the Muses of Pieria (*Works and Days* 1-10). Zeus and the Muses were not farmers. Hesiod claims that Zeus is concerned with justice. Hesiod shows little interest in the land and its history but more interest with the ideals of justice that he wishes to promote.

To know the history of the land is to remember past crop performances under various specific conditions. To know the land is to respond to various specific conditions with positive outcomes. As suggested by the oral instructions I received, knowing the history of the land is key to understanding the soils' performance, its response to climatic conditions, or the method of ploughing, or types of nutrients to apply. Certainly, the notion of knowing the land as suggested by the Dutch farmer's comments that his land, cattle, manure and hay are all different than his neighbours' (Eshuis and Stuiver 142), may be taken as a statement of history – his results are related to his own history and not his neighbours. Dr. Roy was quick to point out that the variable between the two Dutch farms would be so insignificant it would be difficult to measure. Dr. Roy also pointed to the St. Lawrence flood plains of Quebec where the soil variability is slight, a condition that encourages a unified approach to farming in the region.

[158] Murnaghan, 102. "Now that it is increasingly recognized that the *Works and Days* is not actually a farming manual but rather a broader meditation on justice and the will of Zeus."

My own experiences with farming grain in Saskatchewan suggest otherwise; where, despite large tracts of land with distinctly similar soils and similar farming approaches, there was still an element of personal decision making based on personal histories in association with the land and farming. Granted, the perceived difference between the Dutch farms is perhaps not measurable in terms of identifiable soil chemistry or crop yields. It is rather the history of that particular field through the eyes of that particular farmer, but this only shows the highly personalized relationship between farmer and land.

Hesiod does not include any sense of having engaged in farming his land. His absence of personal farming history, and by this I mean referencing personal incidents related to farming, suggests a distancing of the poet to his supposed subject of farming. Murnaghan perhaps provides an answer:

> Because the farmer is a just man, earning an honest living, he speaks just words, and Zeus rewards him with prosperity for doing so. (*Works and Days* 280-281). He is thus in a position to expose, condemn, and admonish those like Perses whose way of life is dishonest and insubstantial, and the corrupt kings whose greed for bribes makes them Perses' accomplices. Furthermore, in recounting the procedures of his livelihood, the farmer-poet is detailing the will of Zeus. (Murnaghan 104)

Hence, the poem is more concerned with presenting the will of Zeus regarding what is a just society than with farming. True, farming is presented as the element of stabilisation within a community but it is only through the notion of having a just society, which Hesiod promotes, does agriculture flourish. Murnaghan argues that, "successful farming entails noting and following the set

of clues to hidden *bios* that Zeus has inscribed in the natural world" which are general clues of:

> …seasonal prompts, signals that the proper time has come to take one action or another, and these can be relied on to produce a livelihood that is compensation of the farmer's labor. (Murnaghan 104)

Yet, to farm successfully a farmer has to know more than seasonal prompts, and has to come to understand the *bios* in personal and very specific terms through the observation and attention to detail. Murnaghan suggests:

> …the successful farmer of the *Works and Days* depends on his powers of observation, responding knowledgeably to what he sees and hears…as he responds, he himself gives visible display of fruitful industry. (Murnaghan 105)

However, the medium through which the response can give "visible display of fruitful industry" is the soil. Given the attention to the soil in agricultural texts of the ancient world (as well as modern), Hesiod's lack of attention to soil conditions places his poetic voice outside the knowledge of the practitioner. Fan, for example, provides a practitioner's knowledge. It is clear that he has observed or received knowledge from farmers, but he has compiled it into a generalized format, and consequently stripped it of the personalized experiences of specific farmers. This should be expected in the type of text that Fan composed. Yet, Fan's detail is more particular than Hesiod's is. Hesiod does not fulfil the expectation of a more detailed personalized reflection on farming.

Hesiod poses his work as a personalized poem, reflecting on a personalized situation, a family dispute. Yet *Works and Days* lacks specific reference to actual family events likely to strike an emotional blow, or a call to

reason over a specific incident (the family's immigration is too general to be considered personalized information). Hesiod does not recount working together with his brother on the farm or learning how to farm from his father. It appears that Hesiod lacks a history he can recall regarding the land he is in dispute over with Perses. Certainly, the finer detail of understanding the soil and the reaction of the plant material to various conditions requires a history that is resident with the farmer.

Hesiod's farmer is a characterisation with a purpose. The pursuit of justice appears to be Hesiod's focus rather than the production of a detailed farmer's almanac. Hesiod's farmer calls for a unification of seeing the world in the manner he proposes and conformity in behaviour to achieve a 'just' society. To do less is to evoke Zeus' wrath. In his persuasiveness he idealizes aspects of farming, while ignoring others, and yet claims to present the formula for the right way to live through successful farming without giving full details on how to accomplish the goal he sets – it is a reward of Zeus that good agriculture can be obtained.

This position certainly marginalizes the practitioners' knowledge of farming. The position also perhaps reveals Hesiod's limited understanding of actual farming knowledge. For Hesiod, anything that occurs after his prescribed activities of farming and the correct timings, is presented as a result of Zeus' will and not the skill or lack of skill of the farmer. As I have demonstrated, Hesiod does not mention key aspects of farming which are essential to know to be successful. This lack suggests to me that Hesiod is unaware of what a farmer

actually must know to farm his land with some level of success. For Hesiod, it is a mystery to some degree how a successful crop is achieved. His observation that hard work and toil are essential perhaps speaks of not understanding that both those actions still require an understanding of the specifics undertaken to achieve specific results. Hesiod seems to have an apparent lack of a history of farming his land. This suggests to me that Hesiod's farmer is a stereotype or a poetic posture employed for the authority of the voice, to expound something beyond farming concerns and more akin to concerns of the urban elite than that of farmers.

Hesiod, by his own claim, is a winning poet, an entertainer, and a performer. Hesiod's 'farmer' is a vehicle in which Hesiod the poet can relay his concerns. In the process, however, the Hesiodic farmer became an iconographic symbol of 'farmer' in the minds of subsequent readers. There remains a body of scholarship that favours the view that the Hesiodic farmer was the creation of a real farmer. Hesiod appears to have influenced the image of farmer in later literary pieces, such as Menander's *The Dyskolos* (342-291 B.C.E.). The impact and influence of Hesiodic supposed image of a ancient farmer is a subject for further study, however.

While researching this thesis under Dr. Paul West, my exploration of various agricultural societies brought me to question the available sources on agriculture – in general they were not composed by farming practitioners but by scholarly or elite observers. Certainly, Fan's text, which is identified as a scholar's work, indicates a history that perhaps reveals a limited accessibility to

the technology of writing for the farmers. Or perhaps as Columella states farmers are too busy to bother with writing. Yet, is this comment not tainted with a bias suggesting that the farmer practitioners' knowledge is viewed at a lower level as are the farmer practitioners (not to be confused with landowners). Columella fails to understand the concerns of the Roman farmers who suggest that the North African treatises are not applicable to their farming conditions. The farmers are able to state their concerns because they have a history with their land. They are observing the results of the changed methods and are aware of the differences between their way of farming and the North African way. The knowledge of the farmers is denied and replaced with literary concerns reflecting perhaps a society with a social stratum imbued with biases that are designed to promote the upper stratum by scorning the lower. Columella silences the concerns of the farmers through mastery of language control. Was Hesiod also practising something similar, focusing on a literary project as did Columella?

Certainly, co-opting the 'voice' of the marginalized and infusing a reluctant acceptance to their fate appeases those who oppress more than those being marginalized. This is not to say that Hesiod's farmer was subject to marginalization at the hands of the elite. Rather, the stereotyped image of farmer speaks of a silencing of actual farmers' voices; their reality is co-opted by the iconographic image of farmer, an image controlled by the non-farming community. Placing the 'voice' of the farmers within the Hesiodic characterisation of farmer effectively silences the actual knowledge which the farmers could impart. Clearly, Hesiod's apparent contempt for the gathering of

farmers in the blacksmith shop (a seemingly insignificant comment) actually reveals that Hesiod is an outsider to the farming community, not knowing what actually takes place in the blacksmith's shop. He is ignorant of the potential social function of the blacksmith's shop (beyond fastening pieces to plough parts). His negativity speaks of ignorance, for the gathering is the place where the hardened 'truths' of farming may very well be exchanged thereby increasing the local farmers' knowledge even further. This exchange characteristically helps the farmers to develop a more effective means of farming relative to their own situations. The blacksmith shop, like the local coffee shop today, is a place were individual farming histories can be heard, and where farmers learn from the failures and successes of fellow farmers.

An ancient farmer out of touch with the history of his soil is a farmer facing a grim future. A modern farmer may rely on modern science to some degree for the history of the soil related to its potential performance, but an ancient farmer must rely on memory drawn not only from his own experiences but also from an accumulated body of information known as oral knowledge. This oral knowledge reflects a history associated with farming and often intimately located to the land, to specific parcels of land. To suggest that farmers were dependent on reading the *bios* of Zeus – the seasonal prompts – is to suggest that farming is solely about ploughing, placing seed, and waiting to harvest. If this were true, the expectation would be for successful crops from every farmer, despite the weather, the soil, and the quality of the seed and the skill of the farmer. The fact that there are variable crop successes strongly suggests that there is more

involved with farming than merely following seasonal prompts; and this is the element missing from *Works and Days* – a sense of a personalized history of Hesiod's land, his approaches, and his successes or failures. This element is so essential to farming, particularly in the ancient world, it is very curious indeed that Hesiod ignored such a basic element in knowing how to farm, if he was indeed a farmer. This is the moment he can truly vie with his neighbours – *man grows eager to work when he considers his neighbour, a rich man who hastens to plough and plant and put his house in order: and neighbour vies with neighbour as he hurries after wealth* (*Works and Days* 20-25) - promoting his knowledge and skills as the blueprint for successful farming, and consequently wealth. Any farmer can read the signs of seasonal change, but this is not what makes a farmer successful; it is the fine detailed understanding of the relationship between the soil, the crops, and the farmer's own personalized farming history that generates farming successes. Hesiod's farmer, therefore, speaks for something other than farming.

I have reached a conclusion, which agrees in part with Marsilio, Clay and Murnaghan that indeed Hesiod is not as concerned with farming as he is with delivering some other message. What that message may be is a question for further research. I hope I have shown that Hesiod's lack of personalized insights to farming indicates a lack of actual farming experience. To end, I will borrow a line from M.F. Finley (though modified), "Hesiod, of all ancient writers, was no mere mouthpiece for the farming-class or their values."

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Appendix

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Nitrogen:
The plant grows poorly and is light green in color. The lower leaves turn yellow or light brown and the stems are short and slender. Nitrogen is essential for proteins (including enzymes), chlorophyll and numerous other plant compounds and, therefore, nitrogen deficiency affects plant growth in many ways at once.

Phosphorus:
The plant grows poorly and the leaves are bluish green with purple tints. The lower leaves sometimes turn light bronze with purple or brown spots. The shoots are short and thin, upright and spindly. Phosphorus is associated with almost as many of the same vital functions in the cell as nitrogen. Deficiency in phosphorus interferes with the performance of these functions. Phosphorus is a constituent of nucleic acids, phospholipids, and most proteins and is necessary for the metabolism of carbohydrates, fats, and proteins and for respiration.

Potassium:
The plant has thin shoots. In sever cases dieback may occur. Older leaves may show slight chlorosis with typical browning of the tips, scorching of the margins, and many brown spots usually near the margins. Potassium seems to be essential to many plant functions, including synthesis of carbohydrates and proteins, regulation of cell hydration, and catalysis of reactions, but its exact role is not well understood.

Magnesium:
First the older leaves and then the younger ones becomes mottled or chlorotic, followed by redding and, sometimes, appearance of necrotic spots. The tips and margins of the leaves may turn upward so that the leaves appear cupped. Defoliation may follow. Magnesium is a structural component of chlorophyll and the cofactor for many enzymes involved in carbohydrate synthesis. Magnesium deficiency, therefore, results in reduced chlorophyll synthesis and chlorosis.

Calcium:
Young leaves become distorted, with the tips hooked back and the margins curled. Often the leaves are irregular in shape and ragged, with brown scorching or spotting. Terminal buds finally die. The plants have poor, bare root systems. Calcium regulates the permeability of membranes, forms salts with pectins in the middle lamella and cell walls, and influences the activity of several enzymes active in the meristematic cells of the growing points. Its deficiency, then, interferes with these functions.

Sulfur:
The plant has pale green or light yellow young leaves without spot formation. These symptoms resemble those of nitrogen deficiency. Sulfur is a component of some amino acids, vitamins, and coenzymes, and seems to be related to chlorophyll formation although it is not a constituent of the chlorophyll molecule. (Agrios, 568-571)