



Lenni Lenape and Modern Practices: Forming a Collective Model to Future Agriculture

Citation

Holmes, Darnell. 2022. Lenni Lenape and Modern Practices: Forming a Collective Model to Future Agriculture. Master's thesis, Harvard University Division of Continuing Education.

Link

<https://nrs.harvard.edu/URN-3:HUL.INSTREPOS:37371601>

Terms of use

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

<https://harvardwiki.atlassian.net/wiki/external/NGY5NDE4ZjgzNTc5NDQzMGIzZWZhMGFIOWI2M2EwYTg>

Accessibility

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

Share Your Story

The Harvard community has made this article openly available.
Please share how this access benefits you. [Submit a story](#)

Lenni Lenape and Modern Practices:
Forming a Collective Model to Future Agriculture

Darnell Holmes

A Thesis in the Field of Anthropology & Archaeology
for the Degree of Master of Liberal Arts in Extension Studies

Harvard University

May 2022

|

|

Abstract

This is a study of the relationship that the Lenni Lenape Native peoples have with agricultural styles of monoculture and specifically the polycultural Three Sisters. For far too long, their voices have been unacknowledged in academic conversations around agriculture and food security. This research addresses silences to connect with Lenni Lenape voices and histories about agricultural practices, with attention to mythology, practices, actions, and stories of the Three Sisters to suggest a Lenape-influenced agricultural practice of monoculture and the impact of Three Sisters agriculture in public garden spaces.

Dedication

I dedicate my thesis to the Lenni Lenape people that have struggled and suffered in silence through history. Also, for the communities that are in need of fresh food, and those who want to cooperate collaboratively to bring about a renewed, reimagined sustainable agriculture.

Acknowledgments

I would like to thank:

My mother: you continually asked me to explain concepts to you. I needed that challenge to articulate my words to show rather than tell. You pushed me to work even when exhausted because you knew I wanted no regrets. Thank you for your boundless love and support.

My immediate family: Thank you for encouraging me, your support, always believing in me, and your unwavering love... 143

My friends: you guys kept me sane and were the reminder that even though apart, we are still together as family.

My Thesis Director, Diana Loren: you helped to keep me grounded and focused to keep the words of this work targeted and meaningful. Regardless of the situations, you were always supportive. Thank you for your constructive and thoughtful edits, comments, and advice.

Thank you to the Lenni Lenape communities that have posted videos and created books, articles, and papers to document some of your points of view on your people, history, and the Three Sisters.

Table of Contents

Abstract	iii
Dedication	iv
Acknowledgments.....	v
List of Figures	viii
Chapter I. Introduction.....	1
Three Sisters Agriculture	4
Research Methods.....	6
Definition of Terms and Theoretical Approach.....	9
Chapter II. Historical and Contemporary Perspectives of the Lenni Lenape on the Three Sisters Objectives.....	13
Literature Review and Critique of Historical Sources.....	14
Shortcoming in Literature from lack of Indigenous Knowledge and Consultation	20
Deficient Experiments	23
Limited Outreach of Results	24
Augmentations	25
Breaking the Trends	26
Silences about the Three Sisters	26
Chapter III. Augmenting Monoculture with Polyculture.....	40
Indigenous Knowledge Perspectives	40
Three Sisters Enacted in the Delaware Valley Today	45

Chapter IV. Recommendations and Conclusions	51
References	56

List of Figures

Figure 1: Map of Lenapehoking –	2
Figure 2: Four String Farm Early Growth Three Sisters	8
Figure 3: Map of Mexico	17
Figure 4: Northern Traditional Dance to lead the Carolina Tarheels to victory	21
Figure 5: Corn Mother	30
Figure 6: The Three Sisters	31
Figure 7: Migration Maps 1699-1774.....	34
Figure 8: 1782 Gnadenhutten Massacre; 100 Moravian Lenape	35
Figure 9: Lenape Delaware Forced Migration.....	36
Figure 10: 1960s excavation in Upper Delaware Valley	37
Figure 11: Lenape Scene.....	40

Chapter I.

Introduction

Agriculture is an integral aspect of our daily lives and plays a role in not only meals, but clothing, health, and wellbeing. The advent of agriculture allowed humans the ability to remain in one place and cultivate the land to sustain their community. Certain crops have different nutrients to help sustain the body as well as take part in certain medicines for ailments. Additionally, uneaten parts of the crops can also be used for clothing materials or for making goods.

While various agricultural crops had different origins and different practices surrounding their usages, the significant ‘transitional phase,’ between hunting/gathering to agriculture practice in many communities took place over a period of 6500 years (Roush, Squash Seeds Yield New View of Early American Farming 1997, 895). Plant domestication began before agriculture’s advent and occurred independently in six to eight regions across the world, between 5,000 and 10,000 years ago (Piperno 2001, 2260; Roush 1997, 894). In this thesis, I focus on historic and contemporary farming practices of the Lenni Lenape¹ (also known as Lenape or Delaware) people, also called “the genuine people,” who have occupied the Delaware Valley in eastern North America for thousands of years (Figure1). As present-day descendants, Indigenous communities in eastern North American have a distinct perspective on specific crops and potential lessons to share with non-Indigenous communities.

¹ In this Thesis, I will be referring to this community as “Lenni Lenape”.



Figure 1: Map of Lenapehoking

Source: Penn Museum (Seldin, Red Hawk Ruth and DePaul 2008)

Understanding the importance of Lenni Lenape perspectives in agriculture is linked to both history and two forms of agriculture, polyculture and monoculture. Polyculture, or multi-crop agriculture, is characterized by a symbiotic relationship: physical and biochemical soil enhancement, low soil erosion, population/spacing management, timing appropriate nutrients, and weed control (Mt. Pleasant 2009, 530). Monoculture is marked by the homogeneity of a

single crop, such as corn. This is the pervading form of agriculture heavily present in developed countries (United States, Europe, etc.) where polyculture has been abandoned.

Understanding the basis and origins of agriculture along with these two forms — polyculture and monoculture — connects the Lenni Lenape’s agricultural practice of the Three Sisters Garden to the modern-day. History is fluent, the forgotten truths may come back challenging pervading historical “facts.” This research on the Three Sisters Garden, seeks to highlight contemporary Lenni Lenape perspectives within the historical Three Sisters polycultural system. Their perspectives, often silenced and neglected by anthropology and archaeology, would likely improve the future of Delaware Valley agriculture, especially if polyculture and monoculture could be advocated as a combined agriculture. To address sustainability issues in agriculture, Indigenous perspectives must be accepted and shared, and as I discuss in this thesis, Lenni Lenape beliefs and practices can be instrumental in crafting a future agricultural system that is sustainable, reliable, manageable, and more effective than the current system.

While this research is grounded in anthropology, other disciplines may find the anthropological focus on Indigenous perspectives supportive in their future studies needed to harmonize a holistic picture on the Three Sisters. Research has been remiss without Indigenous people, particularly the Lenni Lenape, information and perspectives (Griffin 2009; Pleasant and Burt 2010), with regards to agriculture. The focus of this thesis is how Lenni Lenape past, present, and future stories and perspectives on the Three Sisters can positively influence modern agricultural practices.

Much of the anthropological scholarship regarding Lenni Lenape peoples (or other Indigenous) rarely discusses the Three Sisters (Bridenbaugh 1976; Doyle 1996; Griffin 2009;

Kraft 1986). Additionally, there has been little conversation among anthropologists, other researchers, and Indigenous communities around how to augment or combine parts of the Three Sisters with monoculture. Both are viable agricultural options, suggesting the potentiality of a new system adopting methods from both styles.

My thesis question is: What are contemporary Lenni Lenape understandings of historical beliefs and practices of Three Sisters Polyculture? How do they view historical practices today? In what ways could Three Sisters polyculture could augment pervading monocultural practices and where has this been enacted today in the Delaware Valley?

Three Sisters Agriculture

The term “Three Sisters” refers to the three main agricultural crops that have sustained Indigenous peoples for hundreds to thousands of years. To many, they were the difference between living and starvation. The reality and the mythology of the Three Sisters are so important to the Indigenous people like the Lenni Lenape that just hearing the story, “the old people would cry, because at that time, they lived from their gardens” (Morales 2017). Their people could not think of a world without the bounty of the Three Sisters that helped to sustain them for generations.

The Three Sisters is a polycultural and horticultural practice that encourages the use of companion planting with more than one crop to gain mutually positive benefits from each in the system. Most commonly in the Three Sisters are the crops of corn, beans, and squash with some additions such as tobacco or sunflowers. Sometimes wildflowers and amaranth are additionally planted around the outskirts of the garden to entice beneficial pollinator insects to visit the

garden. The precise date at which this practice came into being is not known. However, based on the archaeological studies of Piperno (2001), Roush (1997), and Smith (2001), it can be said that the practice came into fruition at least 1000-2000 years ago accounting for differing rates of crop dissemination. Focusing on the Lenni Lenape peoples of the Delaware Valley, they may have “developed [Three Sisters] ...through process of trial and error... or come in contact with people who already possessed knowledge of horticulture” (Kraft 1986, 117).

Each crop is planted in a mound system spaced apart giving the plants room to breathe and providing soil moisture retention and natural temperature control. Depending on the ways by which they are planted, a garden could be nearly invisible unless it is already known. It does not need to be formed in neat rows and can be alternated or oriented in circle patterns giving different avenues of harvesting and growing paths.

In the present-day Delaware Valley, Lenni Lenape, incorporated corn; “... Delaware “black” (or blue) corn, Grandmother corn, and white flour corn” (Hilaire 2000), beans, and squash with sweet potatoes and tobacco over 200+ acre fields (Mouser 2001). The harmony of corn, bean, and squash form the Native American’s legend about the ““ones who sustain us,’ three sisters living together in the fields” (Hilaire 2000).

The aspect of living together in the fields is very literal in the meaning as they all provide a benefit to the others. The corn provides a trellis of sorts for the beans to crawl up. The beans provide fixed nitrogen to help the corn and squash grow healthier and increase yield. The squash provides shade to the soil increasing moisture retention and limit weed proliferation. Each crop providing their benefits induces the others to grow better as well as provide natural biodiversity which can limit disease and crop loss.

The Three Sisters can provide a large amount of variety when interplanted with multiple cultivars of each crop. Within the same plot of a garden, there could be two or even ten different cultivars of corn, each serving a different purpose for eating, drying, processing, or other attributes. The same can be said for the beans and squash. A garden could contain a mixture of pole and bush beans, some climbing up the corn stalks and others creating a bush between the stalks. Squash of different cultivars and timings can be used where some take a long time to mature and others take a short time, which are planted at a later time.

The way in which the Three Sisters can be planted, shows just how versatile and resilient it is to conditions and how the crops work together to grow. Not only in the growing cycle but in nutrition where it has been seen that the nutritional value of each supports the other with the various carbohydrates (corn), proteins (beans), and Vitamin A (squash) generating a nutritionally valuable meal (F. S. Farm 2010). Growing together and interplanting these crops provides numerous benefits among the diversity of how to orient the garden and cultivars to harvest at separate times based on need or desire.

Research Methods

This research incorporates ethnographic methods to historical and contemporary Lenni Lenape perspectives on Three Sisters agriculture. Utilizing an ethnographic methodology allows for a “focus on learning the meaning that the participants hold...” on the phenomenon (Creswell and Creswell 2018, 182). This method usually employs researchers to physically travel to and observe stakeholders and informants in the actions and behaviors related to the study. For this study, that would entail watching, recording, and asking questions about the Lenni Lenape

people's beliefs, activities and behaviors surrounding the Three Sisters agricultural practice. Ethnography, in this case would document societal dynamics, details, and mannerisms usually unrepresented in quantitative studies. Through an ethnographic methodology, I address the research question in two parts. The first part focuses on contemporary Lenni Lenape understandings of historical beliefs and practices of the Three Sisters. The second part explores how Lenni Lenape people today believe that Three Sisters polyculture could augment pervading monoculture and influenced how it has been enacted today in the Delaware Valley.

To address the first part of the research question related to historical and contemporary perspectives on Three Sisters, I researched primary and secondary sources related to Lenni Lenape and other Indigenous understandings on to mythology, practices, beliefs, ancestral ways, and contemporary ways of the Three Sisters. Indigenous perspectives utilized here are first-hand accounts and videos by Lenni Lenape individuals. While the original plan for this ethnographic methodology included interviews, due to the global pandemic of COVID-19, this study was augmented to accommodate personal and community changes for all involved. However, I did inform Lenni Lenape communities about this research and will forward copies of this thesis to those communities. It is hoped that future studies can include interviews with the Lenni Lenape peoples.

The second part of the research question related to how Lenni Lenape people today believe that Three Sisters polyculture could augment pervading monoculture is addressed by researched old texts describing their garden process. Contemporary sources from gardens that are currently maintaining Three Sisters Gardens and other material and videos with the Lenni Lenape peoples are also included. These sources will allow a more holistic picture of the actions and beliefs on the Three Sisters as well as how Lenni Lenape people regard it in their lives and

its importance for the future. The prevalent themes that are shared will be discussed between the sources and forged together to form a multi-varied perspective on the practices and beliefs surrounding the Three Sisters. They will also help to formulate how the Three Sisters are being enacted in the contemporary world and if those realizations can be further utilized in augmenting monoculture for the future. For example, Figure 2 is an image of Tres Hermanas (Three Sisters) garden on Four String Farm in Rockport, Texas where corn, beans, and squash are planted as polyculture system following Indigenous agricultural practices.



Figure 2: Four String Farm Early Growth Three Sisters

Source: (F. S. Farm 2010)

The data will provide necessary information on previously unvoiced Indigenous perspectives, and yield potentially unknown practices, beliefs, and actions, how their ancient and contemporary ways resonate within them, and how to incorporate methods of both monoculture and polyculture. This research will provide a great wealth of information that will aid the fields of anthropology and archaeology through the benefits indicated in the Literature Review and Objectives sections of this thesis.

Definition of Terms and Theoretical Approach

The terms Silence and Indigenous Knowledge used in this thesis are discussed in this section to understand the context for the study of Lenni Lenape agriculture. Together, these terms illustrate how the silences that have occurred throughout history resulted in the erasure of Indigenous knowledge in historical records.

History refines the historical time frame for the relationship between time and events. Silence and suppression occurred throughout the historical time frame relating to what transpired towards Indigenous peoples. Indigenous knowledge follows the wisdom of silenced Indigenous people through their historical narratives. Agriculture is the thread connecting this historical scale and the main analysis of this research. Agriculture is used to orchestrate the lasting intention of silence through history as not just an advent of time, but a point of contention in the cosmology of the Lenni Lenape people.

In this thesis, I use the concept of history defined by Charles H. Long (2018). Long argues that there are three temporal rhythms for history: the *Long Durée*, *Conjuncture*, and *Evenementielle*. The *Long Durée* is slow-moving and repetitious time, akin to slow-changing environmental variables (mountains, oceans, and rivers). *Conjuncture* is the time of groups or

groupings, the social history rhythm of collective life faster than the *Long Durée* but still relatively slow. Finally, the *Evenementielle* is the quickly moving history of events or nervous fluctuations referring to relatively short-term events through time (Long 2018).

Silence is usually thought of when there is peace or tranquil connotation. However, silence in this research is hostility linked to times of turbulence, violence, and overshadowed or unshared truths or facts. I use Michel-Rolph Trouillot's concept of "Silencing the Past" in relation to history making in periods of *conjuncture* and *evenementielle*. Trouillot notes, "Silence enters the process of historical production at four crucial moments: The moment of fact creation (the making of *sources*); the moment of fact assembly (the making of *archives*); the moment of fact retrieval (the making of *narratives*); and the moment of retrospective significance (the making of history in the final instance)" (Trouillot 1995, 26). Areas where the Lenni Lenape believe they have been silenced will be indicated and explained further.

The concepts of Charles Long's temporal rhythms and Michel-Rolph Trouillot's silence work together within this research to understand the time scale longevity of the abuse on the narrative histories of the Lenni Lenape peoples. Long's rhythms consider the different scales of events as well as his input on the way in which the narratives of Indigenous people like the Lenape were so severely undermined by a full system of "conquering" to limit the access to reveal the dark stories of facts of time. Long also considers the aspect of silences created through oppression as well as hypocrisy on the part of the oppressors. Notably, he would have many "choice" words to describe the situations that have been placed on Indigenous people by the ethnocentric dribble pandered by the so-called "conquerors" and their governments. Trouillot's aspects on silence give form to the silence of suppression achieved in different time periods. Those four moments express different periods in time where the true historical facts can be

changed or altered. Understanding the places and times in which the Lenape's voices have been silenced can help to "reverse engineer" the process of their suppression on the agricultural aspect of their culture.

The contact zone is the setting where silences occurred through history, relating it to the historical narrative. This is not a major term but may be used at times. With respect to the Lenni Lenape people, contact zone would be *conjuncture* and *evenementielle* periods occurring after contact and the aftermaths into the present day. While Mary Louise Pratt first described the concept of a contact zone in 1991 (Pratt 1991, 34), however, this research will be utilizing Long's use of her work. Charles Long uses Pratt's 1992 definition of contact zone where it is a "space of colonial encounters, the space which peoples geographically and historically separated come into contact with each other and establish on-going relations, usually involving conditions of coercion, radical inequality, and intractable conflict (p. 6)" (Pratt 1992, 6, cited in Long 2018, 16). While the contact zone is not a major theme in this research, it is a supporting measure for the context of silence to understand the places and settings for the effects of the suppression on the Lenape people.

Narratives silenced within the contact zones are pieces of wisdom from a people living hundreds to thousands of years before European contact. The Lenni Lenape and other Indigenous peoples had an extensive history in place prior to the contact zone and their suppressed narratives make up Rory Griffin's concept of "Indigenous Knowledge." They identify this term as the "lived experiences of indigenous peoples; these experiences highlight the philosophies, beliefs, and educational processes of tribal communities. A way of life that has been passed down by ancestors of tribal people, IK is a perspective or formula for understanding the world and how

humans live and interact within it” (Griffin 2009, 1-2). This statement is the founding principle upon which the perspectives of the Lenni Lenape are understood. Lenni Lenape oral traditions, beliefs, actions, and practices towards the Three Sisters is their Indigenous knowledge and is the primary resource that this study is meant to acquire.

The agricultural aspect is the main thread of this thesis connecting history and time to silences about Three Sisters from the Lenni Lenape’s perspective. For the purpose of this research, agriculture will be umbrella term for the two practices: monoculture and polyculture. Knowledge and wisdom about agriculture has been passed down through hundreds of years, however, some of that wisdom has been lost to time with the impacts of “conquering”, time, and suppression. Monoculture, in this research, is the farming practices that we see in the modern day with a single crop grown in large areas of land, usually, with the added machinery for processing and harvesting. Polyculture, for this research, will be termed as utilizing multiple (two or more) crops in the same area, which tends to promote diversity protection and growing benefits.

Chapter II.

Historical and Contemporary Perspectives of the Lenni Lenape on the Three Sisters

Objectives

The purpose of this study is to:

1. Learn and understand the histories and stories surrounding the Three Sisters from the Lenni Lenape people.
2. Learn how their historical facts pertaining to agriculture have been silenced.
3. Detail, by their own words, their current relationship with agriculture.
4. Collaboratively learn of and propose potential strategies to augment the pervasive monocultural system with polycultural practices

Additional longer-term objectives include the potential to:

5. Increase positive collaborations between the Lenni Lenape, archaeologists, and anthropologists.
6. Improve and maintain relationships with the Lenni Lenape people for further knowledge sharing and respect.
7. Help to irradicate the negative stereotypes forced on Lenni Lenape Peoples.
8. Help to foster increased positive relationships between the Lenni Lenape and other communities.

Literature Review and Critique of Historical Sources

Before considering the trends that pervade through the literature, it is important to understand the overall state of the literature. The prevailing archaeological data lacks relation to modern agriculture and relevance to how it can be applied to the present and future (Kraft 1986; Piperno 2001; Roush 1997; Smith 2001). These sources largely discuss the inception of agriculture and the crops themselves, but do not mention what knowing this knowledge means for the present or future of agriculture within the field of archaeology. Anthropological researchers find domesticated crop data and agricultural areas but lack discussion on Indigenous crop layouts as there was no conversation with Indigenous peoples (Demchik and Demchik 2011; Martinez 2007; Mt. Pleasant 2009; Pleasant and Burt 2010).

Current literature on the Lenni Lenape people's beliefs, practices, and actions around the Three Sisters is few and far between. In light of this, it would be remiss to not give anthropologists credit for providing solid information even if this information is scarce. The most extensive peer-reviewed articles on the Three Sisters is Pleasant and Burt's (2010) research on traditional Iroquoian cropping systems. While the focus of their study was not the Lenni Lenape, however, Lenni Lenape and Iroquois territories were relatively close together between the sixteenth through eighteenth centuries, a period that has provided much archaeological data on Three Sisters agriculture within the Delaware Valley. Due to this link is geography and timeline, it is important to understand what their research accomplished and what it says about the polycultural system in the modern day. There are additional anthropological and experimental articles that delve into the viability of the Three Sisters and others that focus more on the Lenape peoples through those time periods.

Pleasant and Burt's study detail into an extensive experiment during the growing seasons from 1993-1997 documenting precipitation, temperature, time frames, soil tests, mound techniques, and yields in (bundles) bu/acre and (pounds) lb./acre (2010). The research starts with an in-depth look at what European explorers documented as they first perceived and saw the planting method of the Indigenous people. It then explores the experimental portion where the studies took place, the procedures they followed, and their ending analyses. The conclusion of the experiment is a comparison between monoculture and Three Sisters, indicating how corn yield increased depending on area and planting bean and squash. Each crop of corn, beans, and squash did not yield as much when compared to monocultures. However, the crops did not take up any more room than when in Three Sisters, had a greater yield per acre, and instead produced a surplus with corn as the main source. Overall, there was higher productivity, more food was produced, and there was a higher caloric potential from the Three Sisters as opposed to the monoculture (2010, 76).

Rhea Trotman Martinez (2007) and Mike and Emily Demchik (2014) considered more experiments of this nature documenting weather and pest damage, weed proliferation, soil drainage, labor amount, diet, and yields. Martinez's experiment took course over one growing season, while Mike and Emily Demchik's took place over four growing seasons. Their works invested considerable time and effort into the efficacy of Three Sisters through a comparative analysis on realistic yields of Three Sisters and monoculture and furthered understanding of the processes and potential strategies implemented by Indigenous peoples. Martinez concluded that polyculture like the Three Sisters led to an increase in soil drainage, raccoon damage reduction, higher yield in calories per acre, reduced weed cover, and less damage from adverse weather (Martinez 2007). Demchik and Demchik's research further included labor requirements in terms

of hours for site clearing and crop management, 20.8 hrs., and that of existing gardens, 4.3hrs. This labor was needed for the corn yield range of 14-67 lbs/1000ft² and squash yield range of 125-439 lbs/1000ft² (Demchik and Demchik 2014). Both Martinez's and Demchik and Demchik's experiments showed an agreement and cohesion of results with that of Pleasant and Burt. There were some differences due to the areas of the studies themselves, however, these studies also came to a conclusion that the viability of the Three Sisters was just as effective, if not more effective (in certain situations) than that of monoculture due to its more efficient usage of space, water drainage, and pest management (2007, 75) (2014).

Additional works of literature consider the archaeological aspect on agriculture and the Lenape such as Herbert C. Kraft (1986), Delores R. Piperno (2001), Wade Roush (1997), and Bruce D. Smith (2001). These scholars discussed archaeological viewpoints on material culture, historical evidence, soil analyses, and travel. Piperno (2001), Roush (1997), and Smith (2001) discuss the inceptions of agriculture and the rate of expansion, as well as time frames and linkage of corn, beans, and squash. Piperno also discusses the proliferation of corn or maize from their origin place in southern Central and northern South America within the time scale of spread between 7700 and 6000 years ago (Piperno 2001), which is illustrated in Figure 3. Roush examines the view of early farming by way of squash seeds establishing a change in time scale of transitioning to farming to be 6500 years long (Roush 1997). Smith provides a time scale of spread of corn, beans, and squash and the timing of each to eventually catch up with the other to begin their intermingling concept (Smith 2001). The relevance of these sources is in generating the base line of knowledge to how, where, and when the base crops of the Three Sisters met and how they grew to be so entangled in their culmination of lineage.



Figure 3: Map of Mexico

Source: (Smith, *Documenting Plant Domestication: The Consilience of Biological and Archaeological* 2001)

According to Smith (2001), the map of Mexico (figure 3) shows the present-day geographical range of the wild progenitor populations of the domesticated common bean (red)

(8) and maize (yellow) (7), as well as the area where wild pepo squash was likely initially brought under domestication, based on archaeological evidence (orange) (14, 15). Also shown are the three areas (Tamaulipas, Tehuacán, Oaxaca) where dry caves have yielded much of the available evidence regarding the early pre-Columbian history of these three major crop plants. The associated chart indicates when domesticated common bean, maize, and pepo squash initially appear in the archaeobotanical sequences of Oaxaca, Tehuacán, and Tamaulipas, which along United States form a south to north transect (note degrees north latitude designations). Expressed in calibrated calendar years ago, the dates of initial appearance of these three major crop plants in these four regions are based on direct AMS radiocarbon age determinations (1, 3, 4, 13-15). The age determination for the initial appearance of pepo squash in Tehuacán is based on an AMS date of 7,100 $\pm$ 50 ^{14}C yr B.P (β 123040)-about 7,900 calendar years ago, obtained on seed 201 from Coxcatlán Cave (square 148, level 11, zone XIV) (Smith 2001, 1325) As illustrated, the surges of these three crops at different time scales shows how time and propagation eventually intertwined with the mythology of the Three Sisters over thousands of years. The association that Indigenous people have with each crop of the Three Sisters lasted well over hundreds to thousands of years prior to their first contact with Europeans. This lends to the accuracy and further knowledge that the system was a part of the Long Durée of the Lenni Lenape that helped to shape and mold their people through the generations.

Herbert C. Kraft (1986) took an archaeological lens researching the Lenni Lenape roots as Paleo-Indian pathfinders, and their practices during the Early Woodland (~600/500 BC to 200 BC), Middle Woodland (200 BC to AD 300), and Late Woodland (AD 300 to ~1000/1100) Periods by investigating material culture, beliefs, and practices through the advent of European contact. The details of this work coincide with understanding the Lenni Lenape from multiple

perspectives by highlighting cosmology, orientation, and material culture (remains, clothing, tools, dwellings, etc). While it is unfortunate that he did not obtain much of his information from any Lenni Lenape, Kraft's research provides a solid basis of information about the Indigenous people (1986).

To fully understand Three Sisters within Lenni Lenape beliefs, ethnological, oral historical, and or mythological sources from a Lenni Lenape perspective are necessary (Hitakonanolaxk 1993; Vizzi and Gilbert 2020). Some scholars, such as Carl Bridenbaugh (1976), Theresa Doyle (1996), and Amanda J. Landon (2008), specifically discuss the Lenape or Three Sisters with relevant information on activities and significance pertaining to understanding further how and why certain factors are held. Their works supply information on three time periods in the Delaware Valley, 1610 – 1638, 1638 – 1675, and 1675 – 1700 (Bridenbaugh 1976)— the Lenni Lenape from Paleo-Indians (10,000 BC) to the Lenape's last migration (~1758) (Doyle 1996)—and how plants and human behavior changed in respect to agriculture (Landon 2008).

In the following sections, the work of Bridenbaugh, Doyle, and Kraft is critiqued, particularly regarding their lack of substantial discussion and consideration on the Three Sisters within Lenni Lenape (Bridenbaugh 1976; Doyle 1996; Griffin 2009; Kraft 1986). This agricultural concept is mentioned once or twice, but without detail regarding Indigenous knowledge and consultation as discussed in the following sections. Additionally, their methodological approaches to experimentation and their descriptions of agricultural practice, when coupled with a lack of Indigenous perspectives, result in an incomplete understanding of Lenni Lenape peoples and their practice of Three Sisters agriculture.

Shortcoming in Literature from lack of Indigenous Knowledge and Consultation

Information on Lenni Lenape people is severely incomplete and one step to take is communicating with the actual people on which the research is concerning. Indigenous people living in Delaware Valley and various parts of the country are given little to no voice because they were pushed away and hidden as a result of colonization and Anglo-American efforts to erase Indigenous culture (Barnes 2010, 145). It is only recently that researchers are dutifully incorporating Indigenous approaches to correct current historical narratives.

The research conducted by Demchik and Demchik (2014), Kraft (1986), Martinez (2007), and Pleasant and Burt (2010) held little to no communication with the Indigenous peoples associated with the study, despite the fact that Indigenous communities lived and celebrated in the areas they studied, as suggested by Figure 4. Similarly, Bridenbaugh's (1976) work is limited in its mention of Indigenous peoples or the role they had in the Delaware Valley area during the 17th century. Demchik and Demchik's (2014) research provided no conversations with Indigenous people of Wisconsin. Another clear trend was that the information being garnered on the Three Sisters was and is not being used for information, knowledge, and change (Griffin 2009; Martinez 2007). Overall, all the studies exhibit little or no conversations with Indigenous peoples on topics such as the Three Sisters or on related information such as seasonality of crops or sowing, plot sizes, methodologies, or belief and care practices. Martinez's research on the Lake Superior Ojibwe Peoples of Northern Wisconsin contains information on mentioning their desire to use the Three Sisters, however, she does not explore mythology on Ojibwe agriculture, their practices, or belief system surrounding Three Sisters. It is also not articulated whether or not the Ojibwe people remembered or shared anything on their mythology or if anyone in their community grew food in this style.



Figure 4: Northern Traditional Dance to lead the Carolina Tarheels to victory

Source: Alesha Rowe (Rowe 2019)

Pleasant and Burt's (2010) research relies on accounts of 16th, 17th, and 18th century European explorers, but does not augment the European accounts with any communication or

information from any Indigenous Peoples in New York on practices, beliefs, or mythology.

While some information on native or traditional crop cultivars is included, this information is not derived from Indigenous sources. Griffin's (2009) work possesses communication with Indigenous Peoples, but fell short of delving into the mythology, including those surrounding Three Sisters. The archaeological viewpoint from Kraft (1986) discusses the material culture of the peoples of the Delaware, and despite mentioning Three Sisters, lacks detail on actual practices nor any mention of communication with people for this or other facets of their material culture.

There is a need for interviews with the Lenni Lenape People in order to obtain and understand the historical narratives of their people. Previous studies have neglected to get in depth Indigenous information on mythology or belief system on the Three Sisters that could be unknown to scholars. This would undoubtedly inform the previous scholarships and inform others in the future for the methodology, beliefs, and actions on agriculture. As stated by Griffin, there is a need for modern societies to incorporate Indigenous knowledge (IK) managing natural resources (Griffin 2009). The potential of more information to be distributed could have occurred with more sharing of research access. Most of the scholars, besides Griffin, did not seem to discuss their findings with the local Indigenous peoples (if applicable) after their research was completed to consider if there were deficiencies from their view that the research lacked. For these works, there needed to be some accountability towards the peoples in which they studied or were around. Without this level of cooperation, scholarship will continuously lack a more holistic picture of the study for other researchers and informing future studies. Only with commitment to progressive communication can the relationships between researchers and the Lenni Lenape peoples can be greatly improved.

Deficient Experiments

Agricultural experiments, including experimental phases were limited to short-term trial periods, rather than moderate or extended statistical analyses in the work of Demchik and Demchik (2011), Martinez (2007), Mt. Pleasant (2009), Pleasant and Burt (2010). Experiments conducted by Griffin (2009) and Martinez (2007) were relatively short term, limited to either a few months or one growing season. More information and data could have been included if their experimental phases were extended either within the study or as an extension with added analyses after the publications. While their work is highly detailed and well documented, there could have been more redundancies, limitations, or increases in yields over the seasons had they included or noted to keep the experiment running for longer. The experiments by Demchik and Demchik (2014) and Pleasant and Burt (2010) included at least four growing seasons for a fuller picture of the practices and efficacy. However, this still does not bring into cooperation, the resilience or the lack thereof of the soil and how the repeated sowing and harvesting affected the soil after four seasons, giving a denser longevity scope of viability. By not having direct communication, this limits the scope of viability for the Indigenous people in question. Over time—in this case – hundreds of years— practices and beliefs changed, and these studies considered the early European accounts but disregarded practices that likely have changed through the Long Durée of the Lenni Lenape people. Lenni Lenape and other Indigenous peoples likely changed practices or crops to be more conditional or hardier in their areas, or a litany of other factors not accounted for in these studies, such as plot sizes, methods, or care practices. This brings up the need for a comparative analysis of the historical beliefs and practices differentiating the contemporary Lenni Lenape from their ancient ways.

Limited Outreach of Results

While Griffin (2009) and Martinez (2007) indicated that their research was compiled mainly for Indigenous communities, their research could have been more fully disseminated to a larger group of communities. One trend noticed through the literature was the relatively small scope of outcome intended by the researchers. The importance of sharing results to a larger sphere would be for the betterment of many communities, especially those that have limited access to food or grocery markets. There are numerous communities, including non-Indigenous ones, where people do not have access to nutritious food and would benefit from Indigenous knowledge of agriculture. If more people were to be directly or indirectly impacted by this research and experiment progress, then more people would be willing to learn about the Indigenous people and the Three Sisters agricultural progress.

, Additionally, these experiments have yielded results that can impact health such as reducing risks of obesity, diabetes, heart disease, and sustain cultural tradition (Martinez 2007). For example, Morland et al indicated that black women in their area of study also suffered from these same issues (Morland, et al. 2006, 334). Clearly, the information derived from Indigenous knowledge could be used to help more communities. The main audience of each of these works (Demchik and Demchik 2011; Landon 2008; Martinez 2007; Pleasant and Burt 2010), however, seems to be largely academic, whereas the main audience could have been an academic and public activism outreach to push for more collaboration with Indigenous peoples. This could also provide frameworks for further outreach to more communities so that many people, outside of an “expert” sense, can benefit from the knowledge.

Augmentations

The agricultural style of monoculture often has a negative connotation. Martinez speaks to this when indicating that, “Agriculture [monoculture] in the United States gradually became characterized by the exploitation of natural resources in favor of increased crop productivity.” (Martinez 2007, 5). Pleasant and Burt (2010) and Demchik and Demchik (2011) suggest in their growing season analyses the viability, of Three Sisters compared to monocultures. Pleasant and Burt even concluded that based on the comparative results, polycultures provided an “...increased productivity and decreased risk compared to monocultures” (Pleasant and Burt 2010, 74). This suggests that monoculture is not wholly necessary in the present day. It is unrealistic to do away with monoculture given its prevalence and longevity to this point, but there is a compromise to be thought through. Pleasant and Burt’s data gives promise to an actual possibility, the potential that there is a way for polyculture and monoculture to be combined in a variety of ways to promote the benefits of both and limit the drawbacks. Studies have indicated that benefits of using both styles at the same time include positive impacts regarding caloric amount as well as a multitude of other factors such as weed propensity, labor time required, and amount of each crop harvested (Demchik and Demchik 2011; Martinez 2007; Pleasant and Burt 2010). In this research, the modern-day aspect of getting the Indigenous was missed. The Indigenous knowledge of the Lenni Lenape will also inform this aspect of their thoughts on the potentiality of combining Three Sisters or polycultures like it with monoculture. This will allow a modern-day realm of acknowledgement and conceivable starting points for where agriculture can reach towards the future.

Breaking the Trends

Archaeological literature indicates that there “is no evidence of how the Lenape Indians began to garden, it is only possible to surmise the origins of this revolutionary practice” (Kraft, *The Lenape: Archaeology, history, and ethnography* 1986, 141). Kraft suggests that they started farming by trial and error or by encountering other people that possessed the knowledge of agriculture or horticulture. However, there does not seem to be any consistency in these narratives, likely due to the lack of connection with Indigenous people. Speaking with the Lenni Lenape peoples may help to dispel some of the current historical narratives regarding their agricultural practices. This research is working to fill the void that has been left open by the current literature and where there has potentially been little work in the past decade. The goal is to break the current trends in the literature and use Indigenous knowledge of the Lenni Lenape people. Lenni Lenape people have their own stories to tell, many of which may help to dispel the current negative stereotypes. This action may also help to improve relations between their people and researchers and help to build bridges that were dismantled long ago.

Silences about the Three Sisters

There are multiple accounts on the Lenni Lenape culture by seventeenth and eighteenth European authors (Dutch, Swedish, English, Spanish) that discusses their agriculture practices (Hallowell 1957; Kraft 1986). Many accounts have been determined to be irredeemably disrespectful towards the Lenape people as well as inaccurate in their portrayal of culture, practices, and agriculture (Hallowell 1957, 207). The Three Sisters, in this respect, became its own contested Contact Zone where the Lenni Lenape were suppressed, ignored, and degraded by the Europeans that stole their land and expressed intense hatred. The Lenni Lenape were

removed from their ancestral lands by European influence and Euro/Indigenous conflict, had their ways of life undercut, and were forced to undergo the Eurocentric thought process on spaces, places, and outlook.

This chapter attempts to understand the issues related to the Three Sisters and the Lenape people through the lens of Michel-Rolph Trouillot and Charles Long. Trouillot's examination of historical silencing and Long's examination on the suppression of peoples is important to see how certain events in the Long Durée have affected the Lenape peoples' current belief system, where the destruction of their way of life propagated, and how it is still ignored. The methodology of this chapter is threefold. Mythology related to the Three Sisters or the Corn Mother was important. The many ways by which early Lenape peoples or Indigenous in general were ignored or suppressed by early Europeans is also important. The third facet is the placidity of archaeology related to the blight of the Lenape and native peoples. The facets described are dictated in this manner to understand the Lenni Lenape's cosmo-agricultural practice of Three Sisters and how their relations to it have been suppressed in the historical record.

Native Peoples like the Lenni Lenape have been silenced and suppressed for hundreds of years. We must more fully understand what the Lenni Lenape voices have been wanting to share on their mythology and more specifically tied to the Three Sisters agriculture. Between the seventeenth through nineteenth centuries, Lenni Lenape people have struggled to maintain their way of life. There has been suppression of their beliefs and practices, separation from ancestral lands, and cultural borrowing from friendly and unfriendly Indigenous tribes to the point where some of their practices are lost to time. According to Kraft, the Big House ceremony has not been successfully practiced since 1924, because of lost traditions and lack of new visionaries (Kraft 1986, 13). Additionally, there are virtually no full-blooded Lenni Lenape peoples

remaining and few Indigenous language speakers who the Unami and the Delaware dialects. Today, Lenni Lenape peoples live in various areas of North America, some remaining within the Delaware Valley and others with the officially recognized tribes in Oklahoma, other states and in Canada, which is discussed below. Nearly none of the documentations left come directly from any Lenni Lenape person from that time. Most European accounts of the Lenni Lenape, except accounts by Moravian missionary David Zeisberger (1721-1808), lack any respect or dignity to the voices of the Lenape (H. C. Kraft 1986). This silence of their views over the past centuries has coincided with the destruction of their way of life, removing them not only from their place, but their worldview and orientation.

Archaeologists have not done better as, according to Joe Watkins, they “continue to operate as if the body of science operating within the political structure of the dominant government is a harmless entity to nondominant groups” (Watkins 2005, 432). Within Anglo-American society there was a collective understanding that Indigenous peoples were inferior to the “civilized” Americans, which was used as a rationale to seize lands and violate treaty rights. For far too long, archaeologists never questioned this and often rejected the voices of the people they studied. Through this, archaeology has inadvertently supported the removal of Indigenous peoples from their ancestral or treaty right lands. Many archaeologists did not bother with accepting or trying to prove a connection resonating between the people, the land, and their cosmology. This only served to strengthen the dominant government’s claim to land belonging to Lenni Lenape or other Native peoples (2005, 433). Such has been said when discussing the influence of Indigenous people on American civilization (Hallowell 1957). The frontier period was seen by some, namely Frederick Jackson Turner, as stripping “off the garments of civilization and arrays him [the European] in the hunting shirt and the moccasin” (Hallowell

1957, 203). With this type of ideology, it is easy to see how rampant this rhetoric was and is in the archaeological narrative.

While there is a severe lack of information on the Lenape peoples and their relationship to the Three Sisters, the Indigenous knowledge that they possessed may still reside to some extent with contemporary Lenni Lenape communities and authors (Kraft (1986, 13). The mythology surrounding the Three Sisters is not something that has been written about heavily by Lenape authors. However, their mythos surrounding the Corn Mother is prevalent, suggesting the importance of corn in the past and present as a staple food item in their diet (Figure 5). There are multiple versions of the Corn Mother mythology that begin the same but lead in different directions. The beginning of the story starts with the Corn Mother upset by young men disbelieving in her and even saying that “Corn could not possibly leave the earth” (Bierhorst 1995, 67). After this synchronous beginning, the two renditions exist. One suggests that there were two poor and needy boys that possessed mystic power and spirit that gave a “burnt offering out of mussel shell, sacrificing the shells for the return of corn” (Bierhorst 1995, 91). The two boys returned with two handfuls of corn seed and a pledge to never leave again. The other rendition suggests that an old man, sent by the creator, gifts oysters to the people and teaches them how to feed themselves. This old man takes a young boy to the middle of the sea to speak with Corn Mother but before their meeting, he cooks oysters. The Corn Mother is hungry and accepts oysters as an offering along with song, dance, and shell earrings. The Corn Mother gives them two handfuls of corn seeds and taught them “special songs and dances... it will make me very happy” for the people to show their thanks (Hitakonanulaxk 1993, 65).

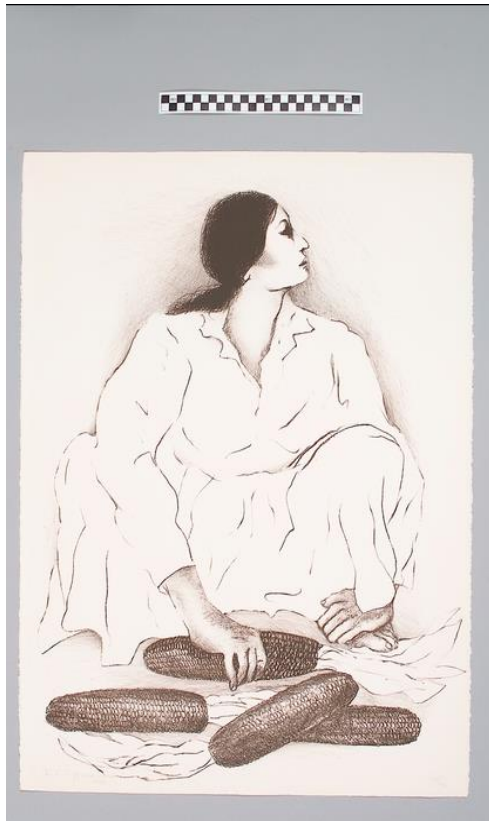


Figure 5: Corn Mother

Source: (Gorman 1972)

There are certain constants in the Corn Mother mythology: the beginning disappointment, two males meet with Corn Mother, and offerings of shellfish. The differences in the mythology are relevant as they give indication that through the Long Durée, the mythos of corn has altered. These changes could be directed by a transculturation of the Lenni Lenape with other Indigenous peoples or by transculturation or suppression by early Europeans, but at this point, there is no

consensus. The Mythology of the Corn Mother is one of the only stories related to that of the Three Sisters (Figure 6) within scholarly literature. Three legends discuss the Three Sisters origins as three sisters that always argued that transformed into plants, the “Sky Woman” landing on turtle island [North America] and giving birth, or three sisters living in a field that meet a stranger (NSU 2021).



Figure 6: The Three Sisters

Source: (Ilkay 2016) <https://www.youtube.com/watch?v=1zjusrToIMY>

There are a few renditions documented online through YouTube which articulate the origin story of “The Legend of the Three Sisters” (Courtyard 2015, Sherry and Talbot 2019). It starts as three sisters in a field love each other so much that they never want to be separated. The youngest in green crawls and hangs on the oldest sister to stand, the middle in yellow runs

around the field, and the oldest stands tall and firm protecting her younger sisters. They meet a boy/human and soon after, the youngest disappears. The two sisters mourn until the Fall, but their sister did not return. The boy/human visits again and soon after, the middle sister disappeared over the night. The oldest sister saddens increasingly from losing her sisters and withered in the sun as the days grew shorter. The boy/human comes back at the final harvest period and sees how the oldest sister misses her younger sisters and takes her as well. At the boy/human's home, she sees her sisters helping the family and is overjoyed to be with her sisters again (Courtyard 2015, Sherry and Talbot 2019). Both stories largely follow the same trajectory and wording. The differences may result from the fact that the story was spoken as an oral history, rather than written down. This could have occurred during key moments where this story in-particular was written down but destroyed in events post-contact with European peoples.

Much of the non-Indigenous literature on Indigenous past grossly diminishes Indigenous presence and input of their peoples as much literature, oral teachings, and traditions were destroyed during colonialism. To a certain degree, the Lenni Lenape as well as other Indigenous peoples were likely made to feel repulsed by their very nature as a concept of civilized self and savage otherness (Gnecco and Hernández 2008, 439-440). During the nineteenth century, this was the goal of assimilation: to send Indigenous students to missions and boarding schools to receive an "education" to become Anglo-American (Lajimodiere 2012). Additionally, according to Bernard de Voto, historians and by proxy, archaeologists have disregarded the role that Indigenous peoples played in American history (Hallowell 1957, 204). The transculturation that took place from European contact to the present day has been shuffled to the side, especially considering the Indigenous peoples' perspectives. Whereas there is research on how early Americans took on the guise of "Indians" or took on that "role", there is little as it pertains to

what Lenni Lenape people or other Indigenous peoples have had to overcome from their own perspectives.

Specific to the Lenni Lenape, part of the reason as to why their own origin story with the Three Sisters is not as readily found is because of their tribe being forced to move repeatedly around North America. The first instance of this occurred after William Penn's death in 1718 when his sons, Thomas and John Penn, and subordinate, proprietary secretary James Logan, took over relations with the Lenni Lenape. What came to be known as the "Walking Purchase", surveyed in 1737, was heavily contested by the Lenape, claiming that the purchase price had never been paid and even threatened violence if Penn's sons tried to force them to vacate the land. According to the original treaty discussed with William Penn, "the Lenape reportedly agreed to convey the amount of land a man could walk in a day-and-a-half" (Reed and Wallace 2019, 29). However, it was said by the Lenape that Thomas, John, and Logan cleared the path to be covered, allowing the "walkers" to cover a path of sixty-eight miles covering over one-million acres.

A day of doom came for the Lenape on July 9, 1742, when Pennsylvania Governor George Thomas, James Logan, with the Penn brother's blessing, used their carefully cultivated relationship with the Six Nations to punish the Lenni Lenape, who were forced to move away from their homeland to make way for the German and Scots-Irish immigrants to whom Thomas Penn had already sold land. This was not the first movement of the Lenape people. From their new area, they were forced out again by multiple intertribal conflicts. The American Revolutionary War and the United States Independence pushed them further west to where they were not even close to their homeland in the Delaware Valley (Bird 2020). By 1774 (Figure 7),

the “Delaware” people were pushed to the westernmost corner of Pennsylvania and even that was taken in the “Purchase of the Triangle” in 1792.

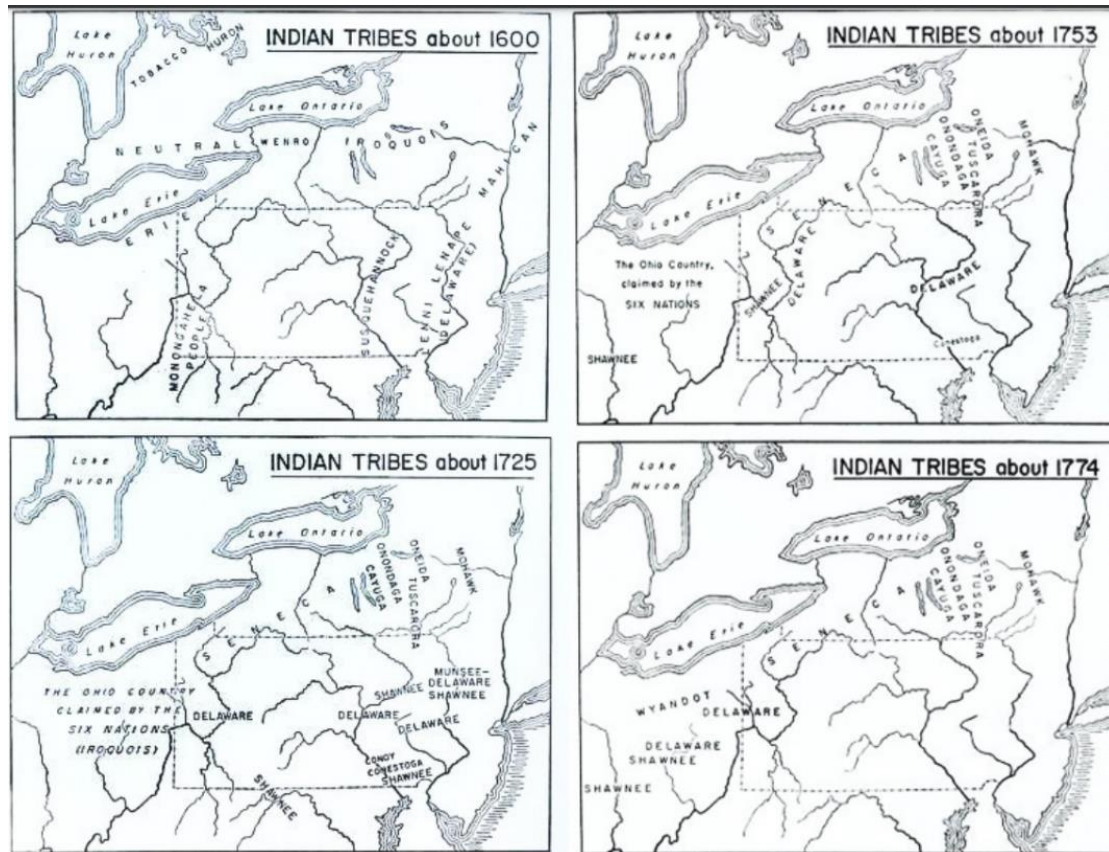


Figure 7: Migration Maps 1699-1774

Source: (Reed and Wallace 2019, 32)

The story of the destruction of Lenni Lenape culture continued in the nineteenth century, when one hundred unarmed Moravian Lenape men, women, and children that had been converted to Christianity by Moravian missionary, Zeisberger, were killed in the 1782 Gnadenhutten Massacre by Pennsylvania militiamen (Weiser-Alexander 2021) (Figure 8).

Repeatedly Americans targeted and persecuted the Lenape people whether it was just or unjust to deal with the “Indian problem”. This is questioning the validity of the American’s actions as such hostility was inconceivable to their beliefs, and destructive to their culture.



Figure 8: 1782 Gnadenhutten Massacre; 100 Moravian Lenape

Source: (Weiser-Alexander 2021) <https://www.legendsofamerica.com/lenape-delaware-tribe/>

During the 1860s, the U.S. government sent most of the remaining Lenape people that were west of Pennsylvania, even further west to the “Indian territory” (present-day Oklahoma and surrounding areas) during the “Indian Removal Policy (Bird 2020) (Figure 9). Forcing the Lenape people away from their homeland, ostracized them from their own origin stories and the

oral traditions that lived in their souls. With fighting and forced relocation, it is understandable how at those key moments of history making and writing, some of their stories are lost to time.



Figure 9: Lenape Delaware Forced Migration

Source: (Bird 2020)

Rarely is there any literature on how Indigenous people like the Lenni Lenape perceive archaeologists, possibly due to lack of access to the mediums of scholarship or resignation that “it is what it is.” To this end, researching the material culture and stories, like the Three Sisters, of the Lenape people could yield results that were incorrect due to the lens of thought. Joe Watkins (2005) shares some of the thoughts that Indigenous peoples viewed the field of

archaeology negatively. One of the main reasons cited by Watkins is historian Devon Mihesuah (Oklahoma Choctaw), who stated that “(1996) the only difference between an illegal ransacking of a burial ground and a scientific one is the time element, sun screen, little whisk brooms, and the neatness of the area when finished” (Watkins 2005, 434). This is a brutal scathe against Archaeology as it likens the discipline to graverobbing, as can be seen here in this image of archaeological investigations in the 1960s on ancestral Lenni Lenape land (Figure 10).



Figure 10: 1960s excavation in Upper Delaware Valley

Source: (J. Kraft 2008).

There was also the continued abuse of the Lenape people through the ages, both by political figures and exacerbated by archaeologists, anthropologists, and other scientists. Robert Taft portrayed them as "miserable, dirty, lousy, blanketed, thieving, lying, sneaking, murdering, graceless, faithless, gut- eating skunks as the Lord ever permitted to infect the earth..." (Taft 1953:66) (Hallowell 1957, 207). During this same period of time, they were specifically referred to as "red ni**ers" in Kentucky (1957, 207). Don Sampson, a former Chairman of the Board of Trustees for the Confederated Tribes of the Umatilla Indian Reservation, voiced his opinions on the differences between science and their religion. According to him, "We do not reject science. In fact, we have anthropologists and other scientists on staff, and we use science every day to help in protecting our people and the land. (Sampson 1997)" in (Watkins 2005, 434). Instead, they reject science as the answer to everything and that it should take precedence over the religious right and beliefs of American citizens. To a point, this makes perfect sense as the basis of factual science and faith are areas where stories can blend and intertwine creating a compromise between science and religion.

There must be a consensus within archaeology regarding relationships with Indigenous people, like the Lenni Lenape, that they must not "continue to treat American Indians as belonging outside of science" (Watkins 2005, 433). Indigenous people are not outside of science; the only basis that was outside logic and fact of science were the ideologies of those researchers who thought they were "better than" and knew nothing other than their baseless hatred and bigotry. This type of perceived reality is most likely shared by many other peoples which calls into question, how this cycle of disregard and silence and anger and pain be ended.

As illustrated, there are various reasons as to why Lenni Lenape, among other Indigenous people, have lost historical stories and beliefs, some pertaining to The Three Sisters. There is little chance that much of their culture has not been damaged by the treatment they have received in their own country through the Long Durée of their people. However, it is not irreparable over time with tolerance, understanding, and history embracing rather than silencing. The Three Sisters are such a phenomenon cosmo-agricultural system that it can grow from beyond the folds of history and further into the mainstream of agricultural understanding and practice. Researching this agricultural system can bring it to the mainstream to potentially augment agriculture. As an additional prospect, it can be the catalyst to aid in mending relationships between Indigenous people (Figure 11), archaeologists and other scientists.

Chapter III.

Augmenting Monoculture with Polyculture

Indigenous Knowledge Perspectives

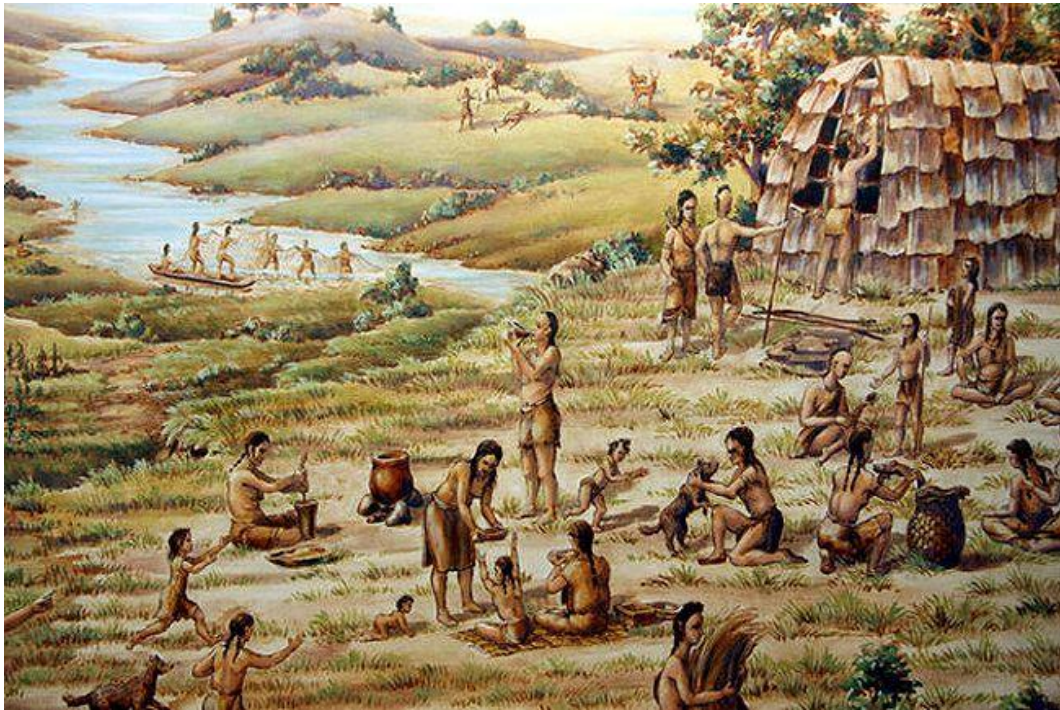


Figure 11: Lenape Scene

Source: (Weiser-Alexander 2021)

The perspectives illustrated by the Lenni Lenape peoples in this chapter have been found through scouring academic journals, online chat logs, and general searches. Additional first-person Indigenous knowledge and stories will stem from interviews in a future research piece. A general theme weaves between the ideals to understand the perspectives of the Lenni Lenape people on the Three Sisters. Unveiling the general theme between necessitates understanding each on their own terms.

Jaguar Bird (2020) gives a brief history of the Lenape People, their movements after contact with Europeans and then Americans, and also part of their internal society which housed the Three Sisters. Their video describes the ways that the Lenni Lenape have been “removed” to areas of North America. In the video, Jaguar Bird describes how after the American Revolution, all Lenape were seen as defeated British Allies. Pro-British Munsee and Moravian Lenni Lenape (to escape Americans) moved to Canada and established their own communities. The Pro-American Lenni Lenape that stayed in the present-day United States were eventually “removed” further West to Kansas and then to Oklahoma. Currently there are only three federally, three state, and three Canadian recognized Lenni Lenape/First Nations Tribes. Until the mid-1860s, the Lenaphoking was led by matrilineal clan ascendancy and leadership. The removal and religious converting of Lenni Lenape led to this decline. The importance of matrilineal leadership related to the Three Sisters is that this polyculture was managed solely by the women while the men hunted and harvested seafood for their primarily sedentary habitation. Their main crop, maize, was planted in March and served as a trading crop for iron tools with seventeenth century Europeans. The squash was used to cut down on weeds and retain soil moisture. The general history of the Lenape meshes with the livelihood of the Lenape due to their sedentary

lifestyle. They were forced to move repeatedly over the years and with that, their relationship with the land and the Three Sisters was repeatedly broken (Bird 2020).

A 2014 WFYI video on the Delaware Tribe of Bartlesville, Oklahoma details Conner Prairie in Indiana to teach the youth about the Lenape history in the area. While this video does not describe the Three Sisters, it does address the outreach that Lenape tribes have done to teach others about the history of the land they inhabit. There was no text or mention in any of the state history that there was ever a Lenni Lenape Tribe presence in the area. The presenters for the tribe educating the participants on the history of their tribe and the land area included Former Chief Dee Ketchum, Tribal Council Member Annette Ketchum, Delaware Tribal Elder Michael Pace, Delaware Culture Bearer Todd Thaxton. They shared music, tribal history, and language along with dance to show the participants how their history intersects with the land and the passages of time (WFYI 2014).

A 2013 video by the Oneida Digital Media discussed the Three Sisters to educate children in a way that is entertaining and educational. They employ the medium of puppets similar to that of Sesame Street to appeal to the children and teach them the ways of the Three Sisters. The puppets are taught about the Three Sisters by a man named Sugar Bear. He teaches them about the placement of the corn, beans, and squash along a mound and the spacing of three feet between each mound. He teaches them about the historic ancient ways by which they planted the crops, using bones of game and stones instead of modern tools. Sugar bear addresses the relationship between the crops as well as the order of planting each. The corn, beans, and squash each serve a purpose of sustenance as well as production and cooperation to maintain together and produce a harvest supplying the nutritional needs of the Oneida people (Media 2013).

In coordination with the Oneida Nation of Wisconsin and the University of Wisconsin, Gail Danforth, an Oneida Elder and Faith Keeper, discusses the Three Sisters in a 2017 video. She discusses, similarly to the previous sources, the orientation of the crops, but goes further in her description. Danforth notes that beans are planted when the corn is 6 inches in height, to grow together, and the squash serves to control pests and insects as well as retain water for the plants. She discusses the different stages at which they can eat their crops in early harvest and ripened harvest periods. At the start of the nineteenth century, they grew 18 different kinds of corn, 60+ kinds of beans, multiple squashes and melons for varied purposes. Beyond the crops, she mentions part of the rationale surrounding the reason for the multi-crop system, “If a blight... hits one type of corn, you still have lots to fall back on.” (Morales 2017). Danforth uses the garden as a medium to introduce language to her students and educate them on the ways of their people. She speaks of the mythos behind plants and the power and gratefulness that their people have to the plants as the alternative for their people would have been starvation. The more people or families that are part of the garden system, the more oral tradition knowledge is shared on how to eat, cook, prepare, and store each crop (Morales 2017).

Combining all the words and perspectives of the Indigenous people that have shared on their history and the Three Sisters, it is clear that they truly believe in its viability as an agricultural system. There were two overarching themes that every source shared. The first was the outreach that must be done to educate not only the public but also younger Indigenous generations. The second theme was their passion to ignite the Three Sisters into a more mainstream process of thought and way of being.

Each source highlighted the importance of outreach for their people. Those in Indiana have no recorded history of Lenni Lenape settlements, however, the Lenni Lenape have held a

footprint there for centuries. The public there had little idea why their state was named “The land of the Indians” as there was not even a shred of Indigenous history officially recognized, even though the evidence was plentiful and clear. The 2020 Jaguar Bird 34-minute video is aimed at outreach across the internet to share the history of Lenni Lenape people with the world so that they can see, understand, and empathize on the basis of place, space, and life. Regardless of the three federal, three state, and three First Nation tribes recognized in the United States and Canada, there are dozens of more tribes still petitioning to be heard and recognized for who they are and where their history leads. Without outreach, there can be no movement forward or momentum to embrace the ways that had been lost. Outreach by many mediums, online included, was one of the ways the Lenape people could keep alive, both their traditions and actions as well as their language. As illustrated by Gail Danforth, the outreach through the Three Sisters Garden provided young students with the language of the Lenni Lenape as well as availed them to internalize the actions, principles, and belief system of their culture.

Bringing the Three Sisters out into a more mainstream view was parallel to the outreach to serve both purposes. The Three Sisters is engrained into the being of many Indigenous peoples and as such, can be used as a medium to process thought and engage others in conversation and life. Not only was it a way of being, but it was also a way of life that was tantamount to stave off starvation and give life. With so many people suffering from hunger in the world and seemingly not enough food to go around, it makes perfect sense to propose and encourage the usage of an agricultural system that maximized food production, decreased likelihood of weeds, and decreased the event of total crop devastation. The passion that each Indigenous person spoke of the Three Sisters is one that gives you a sense of how it must have meant to those that utilized it to survive and live together. When Danforth mentions the elders crying when the story of the

Three Sisters was told, it imparts an amount of necessity to carry on the tradition to honor their tears and suffering. It breathes a thankfulness that the Three Sisters were there to allow food for a multitude of generations, even those of the European settlers, as without them, the Europeans would surely have had to leave the “New World”. Therefore, the Three Sisters are so important and are so impactful through the Long Durée of humanity itself and especially the Lenni Lenape.

Three Sisters Enacted in the Delaware Valley Today

There are a number of contemporary Three Sisters gardens that have been planted in the Delaware Valley that honor the legacy of Indigenous cropping systems. Some gardens are for families, to support their family’s food needs using a system that is lucrative and yields adequate food. Other gardens are in more public spaces, enacted by universities and public gardens throughout the country. Discussed here are gardens based in the Delaware Valley ancestral lands; forced migration footprint areas in Iowa and Michigan; and California.

The Iowa State University has a Three Sisters Garden program headed by Associate Professor of Anthropology, Christina Gish Hill. In her (2020) article, Hill discussed the ways in which she is working to understand why Indigenous farming practices declined and ways to reinvigorate these practices in the present-day. She worked with an agronomist, horticulturalist, nutritionist, and native gardening specialists to understand and conduct outreach about the Three Sisters. Based on this research, she discusses the benefits of the Three Sisters, which include abundant harvests through mutual relationships between the corn, beans, squash, and other crops. In her discussion, she draws attention to the ways that Indigenous children in the United States were forced to attend boarding schools, which turned them away from Indigenous ways and

resulted in some amount of self-hatred for their own Indigenous traditions. The ISU's Horticulture Farms work to revive the Three Sisters for the pursuits of nutrition and traditional knowledge sharing. Their current research plots are helping to quantify the benefits of intercropping and encourage rematriation of crops to Indigenous communities. Their system at Iowa State University interplays the knowledge from Indigenous communities as well as modern techniques to revitalize the Three Sisters in the mainstream and reestablish them as a viable agricultural system with nutritional value and abundance (C. G. Hill 2020).

In Michigan, one of the areas the Lenni Lenape traveled through on their forced migration to the West and North within North America, Small House Farm uses the internet as a means to discuss and promote their Three Sisters Garden. They use multiple types of corn, beans, and squash to produce food for eating “now” and food for storing purposes. They discuss the benefits of the system as well as their own rendition of the system, why they take certain steps, and part of the history of the system. Using the Three Sisters Garden as a teaching medium and practical practice, they explain the importance starting with the mound to support roots, ease of weeding, multiple planting methods, and planting on south side of mounds. They also indicate a waiting period between planting corn (8-12in. height) and beans, so that the beans do not crowd the corn and pull them down, paralleling the timing scheme of Indigenous practitioners. Detailing the different varieties of crops grown, they opted to plant a longer season squash, a flint corn (native to the area used by Indigenous persons), and two half-runner types of beans. Each crop that they plant has multiple purposes depending on when they harvest, each can serve as storing crops or harvested earlier for multiple cuisines, to stack functions and diversify the scope of viability (Farm 2020).

The University of California, Agriculture and Natural Resources UC Master Gardener Program discussed the benefits of the Three Sisters and promote outreach to the public about their garden located in San Jose, California. Their garden includes multiple varieties of crops, including corn, beans, and squash, in addition to sunflowers or marigold as pollinator promoting plants. The garden itself, was a test, checking its viability and productivity. They planned a layout, outlining the number of plants of corn, beans, squash, amaranth, and sunflowers in addition to fencing, drip irrigation, and compost soil preparation. Each mound had a particular number of each crop covered with straw and flowers outlining the entire fenced area promoting beneficial insects. They utilized multiple varieties of each crop, diversifying the area; three varieties of popping corn, three varieties of beans (one pole and two bush), along with pumpkins and gourds. The main purpose of the garden is to act as an educational resource for local schools and provide resources to those interested in starting their own gardens (Gardeners 2020).

The Historic Fair Hill Garden explores food that was served in the colonial era, including the foods served at the famous first Thanksgiving. Within Pennsylvania, the Historic Fair Hill constructed their urban gardens with a section dedicated to the Three Sisters to learn more and embrace the agricultural style of the Indigenous peoples they modeled their garden after, the Lenni Lenape people. This garden gives respect and pays homage to the Indigenous peoples that inspired their garden. Their garden attends to how Indigenous society and agriculture contributed to the first recorded Thanksgiving, in 1621. According to their sources and backed up by information shared above regarding the care of the Three Sisters, the garden was cared for by women and left open without fencing, effectively invisible to early European eyes. Crops grown in addition to corn, beans, and squash in this system were sunflowers, pumpkins, tobacco, and various herbs. Contrary to Early European beliefs at the time, Lenni Lenape men had a different

set of tasks related to building, hunting, fishing, and trapping utilizing the natural areas and rivers around to augment the fresh produce from the gardens (H. F. Hill 2022).

Penn State offers a Master Gardener program that includes the Three Sisters Garden, highlighting the huge benefit that this system had in the past. They note that early European settlers may not have survived without the bounty of the Three Sisters. While this source does not talk about a garden being used actively, it gives the specifications for making and constructing your own Three Sisters Garden and foundational viability reasons. They discuss the structure of the corn stalks for trellising the beans, beans fixing nitrogen for the other crops to absorb, and squash shading the soil and increasing moisture retention. They also indicate an important facet as the vines of the beans and squash that can be left in the soil to act as natural compost providing added nutrients to the soil for the next planting season of crops as well as information on the measurements and materials needed to plant a garden. Suggestions are also given for mound size for the crops, temperature and month for planting corn, number of seeds to plant, and give a diagram template for individuals to follow to create their own 10x10 foot garden plot. This source encourages the creation of your own plot, while giving background implications as well as variable importance to present-day agricultural techniques (Robbins 2022).

The Three Sisters polycultural system is a practice that continues in the Delaware Valley as well as other parts of the country. It is promoted by individuals and programs that understand the benefits, history, and importance. Each individual and program that has an active Three Sisters Garden has discussed their own renditions and own processes, loosely based on the practices of Indigenous peoples, like the Lenni Lenape. Looking through their words and videos, two main points come across. The first is that each pays respect and homage to the Indigenous

people that inspired their gardens. The second is that each garden articulated the usage of a variety of corns, beans, and squash for a diverse range of crops used for fresh produce or storage.

Each source discussed in this section referenced the Indigenous people that paved the way for the Three Sisters. Each articulated their belief that the Three Sisters is a viable and reliable system for produce and sustainable harvests. In addition to the respect paid, they used their mediums as platforms to add to the conversation in promoting the Three Sisters. Either through media by YouTube, University programs, or websites, outreach to engage their audience was a vital part of their work. Some shared their experiences in planting the crops, some detailed their processes in creating the system with measurements, and some went through their entire process and even the educational outreach they supply. The people and programs working to promote this system, as well as actively participate in its proliferation, are the people and groups in the communities that can help expand this system into the mainstream. Their areas are welcoming the Three Sisters and engaging with the history; that is what is needed to not only encourage the Three Sisters within Indigenous communities but in other communities that need fresh foods that are reliable and host a variety of purposes.

The Three Sisters is a polycultural system that has many allowances for a variety of different crops along corn, beans, and squash. The Lenni Lenape planted multiple types of corn that would be used in storage and in fresh cuisines. That same reality has been taking place in the Three Sisters gardens of the present-day. Multiple types of corns, beans, and squashes are being planted in the same orientation and while some are used in fresh dishes, others are dedicated for seeds and storage. As indicated in the homestead video, they plant two different types of beans and a long harvest squash with a flint corn. For example, the University of California Master Gardener program utilized a multitude of diverse corns, beans, and squashes. This experiment

indicated that crops utilized within the Three Sisters can be incredibly diverse and that it is beneficial to plant more than one type of corn, bean, and squash. This can include a wide variety, even in some cases bush beans, rather than pole beans. In a multitude of ways, the reliability that these modern gardens profess, validates the real-world tests that anthropologists, such as Pleasant and Burt (2010), Demchik and Demchik (2014), and Martinez (2007), have conducted on the Three Sisters and indicated in their results. The Three Sisters is a reliable and variable agricultural system that can grow and yield naturally healthy and nutritious foods that can sustain a community. In addition, the more people that contribute to the garden, the less time is needed by each member working the garden and the overall enjoyment and yield increases. This system also has the additional benefit of not needed several steps that modern agriculture usually needs due to the prospects of the squash discouraging unwanted pests and variety of crop guarding itself from total crop failure.

Chapter IV.

Recommendations and Conclusions

This final chapter will cover some of the recommendations and the conclusion that have been drawn from this research addressing enacting polycultural strategies and monoculture into potential real-world settings and bridging the divide between anthropologists and Indigenous communities like the Lenni Lenape. This will also address the potential ways that combination agriculture will benefit the Lenni Lenape and other communities. The ideas presented here are with the best intentions of addressing, holistically, the nutritional issues plaguing the Indigenous people as well as other communities that are in need of this knowledge. In the future, when interviews are being conducted, these strategies will be presented to the Lenni Lenape and based on their input, will be increased in scope and depth based on their mythology and contemporary practices.

As illustrated in the previous chapters, there is a need to understand and truly listen to the stories of Indigenous peoples. Their stories and mythologies hold many truths that have been silenced and washed away from the history making moments for far too long. The Three Sisters Garden is one such cosmological realm that allowed for the survival of many people through hundreds and thousands of years. The Lenni Lenape, potentially, one of the originators of this agricultural practice have tried to share their history from the obscurity of academia and it is far time that their knowledge be welcomed into the mainstream.

There is no feasible way that monoculture would be completely switched to polyculture, given its prevalence in the contemporary world. However, there are ways that they can be

combined as a mixed methods agricultural practice that can have drastic positive implications for the future of Indigenous peoples and other communities. Monoculture has been so ingrained into the function of the United States that augmenting it, is the only pathway to include polyculture like the Three Sisters to have a positive effect on the agricultural situation.

Combining the aspects of polyculture and monoculture is one of the main pieces to address to create a combined agricultural system. As seen from Pleasant and Burt (2010), Demchik and Demchik (2014), and Martinez's (2007) research, planting corn as a monoculture yields more in a large group. However, this is also assuming that there is nothing affecting the corn negatively such as disease. Additionally, it was also seen that planting corn in similar plots between polyculture and monoculture, the Three Sisters yielded more caloric potential considering it also contained beans and squash in the same space (2010). (2014) (2007).

Seeing as corn is one of the most planted and harvested of the Three Sisters, it will be used as the main monocultural type in the following examples, however, it can also be used by beans or squash. One reasonable way to address combining monoculture with the Three Sisters is to surround plots of corn monoculture with the Three Sisters in a grid pattern. This would involve planting a corn monoculture same as usual but planting the Three Sisters as a natural barrier on three sides of the monoculture. This would allow for machines used in modern monoculture to be used on the fields. Additionally, this would act as an insulation for the monoculture providing increased beneficial insects, increased soil water management around the monoculture, limit weeds around which should aid with the monoculture, while at the same time providing the added boon of plenty of squash and beans on the periphery.

One could also interchange sections of monoculture and the Three Sisters as side by side. On a field plant alternating sections of corn monoculture with the Three Sisters. This rendition

would also allow for the continued usage of modern monocultural machinery while creating side by side barriers protecting the monoculture from pests and limit the need of pesticides as increased beneficial insects would block out pests. The benefit of side-by-side planting is that this would allow for two separate harvest periods which would increase the food for farms as well as increase the amount of food for storage as well as more food to sell for farmers. This would provide water retention on both sides of the monoculture reducing the amount of water needed.

An additional method could be to fully surround a monoculture with the Three Sisters, imagine the face of the sunflower. The monoculture would be on the inside and the Three Sisters would be the petals of the sunflower. Doing this, while limiting modern agricultural machinery would fully insulate the monoculture crop for water retention, pest control, soil nutrition – limiting needed fertilizer, and weeding.

Each of the three recommendations that are posed can be tested actively and can be researched repeatedly in order to provide statistical data for its viability. Each posed recommendation combines the positives of the Three Sister with monoculture by leaning their faults where the other shines. Monocultures of corn, bean, and squash grow more than Three Sisters independently. The Three Sisters shows more yield overall in a given space. Monocultures do not have to be harvested by hand while Three Sisters gardens are usually handled by hand. Three Sisters gardens can be harvested multiple times which may not compete with the harvest periods of the monocultures. The Three Sisters gardens would also act as insulators around the monocultures for pest management, water management, soil management, weather damage mitigation, space management, weed management and mitigation, and an increased caloric yield due to the interplanting of the Three Sisters.

To address the Indigenous communities that have been struggling in their communities with increasing health issues due to lack of nutritional food, they must be encouraged to return to their Three Sisters practices. There must be a conscious effort to include them in the conversations surrounding the Three Sisters with the academic community as well as other disciplines to learn from each other proactively. Many people on reservations get their food from government supplies or fast food, which unfortunately is not as healthy as it should.

The measure to curtail this is to approach Lenni Lenape communities and forge a relationship with them personally and professionally to understand the issues what they face regarding food. Anthropologists and other researchers must embrace the stories and histories that are shared and leave their potential biases behind. The history making moments that have been stolen from the Lenni Lenape and other Indigenous must be unveiled and shared to the academic community as well as the public. Their communities need the measures to have healthy food that they grow. Not only would this help to fill their communities with healthy food, but it would also allow them to hopefully regain a bit of their beliefs and practices that were stolen from them through colonization.

There are numerous communities that are already embracing their Three Sisters gardens and are providing a much-needed outreach to the world to share their knowledge and share their passion that has saved their people. Outreach is the principal component of promoting the Three Sisters in the Lenni Lenape community and by extension, many other communities. This research was served with the purpose of extending an olive branch between the antagonistic relationship between anthropologists and Indigenous communities as well as providing a framework upon which the Three Sisters polyculture and monoculture can be combined in a mutually beneficial relationship. There is still work to be done regarding the involvement of the

Lenni Lenape with this research, however, this will be addressed with additional interviews as well as future experiments adopting the strategies of the Lenni Lenape and combining them with monocultural practices.

References

- Barnes, Dr. Ian. 2010. *The Embattled Delaware*. New York, New York: Chartwell Books.
- Bierhorst, John. 1995. *Mythology of the Lenape : guide and texts*. Tucson: The University of Arizona Press. Accessed February 8, 2021.
<https://babel.hathitrust.org/cgi/pt?id=mdp.39015034512742&view=1up&seq=7&q1=212>.
- Bird, Jaguar. 2020. *The Lenni-Lenape / Delaware People: Algonquin - USA & Canada*. April 14. Accessed November 25, 2021. <https://www.youtube.com/watch?v=AYvgHGqD-ZU>.
- Bridenbaugh, Carl. 1976. "The Old and New Societies of the Delaware Valley in the Seventeenth Century." *The Pennsylvania Magazine of History and Biography* 100 (2): 143-172.
https://www-jstor-org.ezp-prod1.hul.harvard.edu/stable/20091051?seq=1#metadata_info_tab_contents
<https://www.jstor.org/stable/20091051>.
- Courtyard, Widdifield. 2015. *The Three Sisters Legend*. July 27. Accessed January 20, 2022.
<https://www.youtube.com/watch?v=Fx9CDVkn9xU>.
- Creswell, John W., and J. David Creswell. 2018. *Research Design: Qualitative, Quantitative, and Mixed Methods Approaches*. Fifth. Los Angeles: SAGE Publications, Inc.
- Demchik, Mike, and Emily Demchik. 2014. "Observations on the Productivity and Time Required for a Corn and Squash Polyculture, Portage County Wisconsin." *Plains Anthropologist* 56 (217): 71-81. doi:10.1179/pan.2011.007.
- Doyle, Theresa. 1996. *A HISTORY AND BIBLIOGRAPHY OF THE LENNI LENAPE*. Thesis and Dissertations 2153, Rowan College, 1-88.
<https://rdw.rowan.edu/cgi/viewcontent.cgi?article=3157&context=etd>.
- Farm, Four String. 2010. *The Three Sisters*. July 9. Accessed October 13, 2021.
<https://fourstringfarm.com/2010/07/09/tres-hermanas/>.
- Farm, Small House. 2020. *Planting Our THREE SISTERS GARDEN*. June 21. Accessed January 20, 2022. <https://www.youtube.com/watch?v=0SyKclXdz-A>.
- Gardeners, UC Master. 2020. *UC Master Gardeners of Santa Clara County*. June 24. Accessed December 5, 2021. <https://www.youtube.com/watch?v=HrGgCs7EqOY>.
- Gnecco, Cristo'bal, and Carolina Hernández. 2008. "History and Its Discontents: Stone Statues, Native Histories, and Archaeologists." *Current Anthropology* 49 (3): 439-466. Accessed April 20, 2021. doi:<https://doi.org/10.1086/588497>.
- Gorman, Rudolph Carl. 1972. "Corn Mother." Smithsonian National Museum of the American Indian. *Corn Mother*. Albuquerque, New Mexico: Smithsonian. Accessed January 15, 2022. https://americanindian.si.edu/collections-search/objects/NMAI_275680.

- Griffin, Rory D. 2009. *INDIGENOUS KNOWLEDGE FOR SUSTAINABLE DEVELOPMENT: CASE STUDIES OF THREE INDIGENOUS TRIBES OF WISCONSIN*. Masters Thesis, College of Natural Resources, University of Wisconsin, Stevens Point: University of Wisconsin. <https://epapers.uwsp.edu/thesis/2009/griffin.pdf>.
- Hallowell, A. Irving. 1957. "The Impact of the American Indian on American Culture." *American Anthropologist* (University of Pennsylvania) 59 (2): 201-2217. Accessed May 17, 2021. doi:96.227.82.127.
- Hilaire, Larry. 2000. "Corn: An American Native." *Spanning the Gap* (Newsletter of Delaware Water Gap National Recreation Area) 22 (1). <http://www.npshistory.com/publications/dewa/spanning-the-gap/v22-1-2.pdf>.
- Hill, Christina Gish. 2020. "Returning the 'three sisters' – corn, beans and squash – to Native American farms nourishes people, land and culture." *The conversation* (The Conversation). Accessed December 4, 2021. <https://theconversation.com/returning-the-three-sisters-corn-beans-and-squash-to-native-american-farms-nourishes-people-land-and-cultures-149230>.
- Hill, Historic Fair. 2022. *LENNI LENAPE FOOD IN THE COLONIAL ERA*. Accessed November 12, 2021. <https://historicfairhill.com/2015/11/26/thanksgiving-lenni-lenape-food/>.
- Hitakonanulaxk. 1993. *The Grandfathers Speak: Native American Folk Tales of the Lenape People (International Folk Tales)*. New York: Interlink Books. Accessed April 10, 2021. https://www.amazon.com/Grandfathers-Speak-American-International-Paperback/dp/1566561280/ref=sr_1_4?dchild=1&keywords=Lenape+Indian+Books&qid=1614366248&sr=8-4.
- Ilkay, Jasmine. 2016. *The Three Sisters*. <https://www.youtube.com/watch?v=1zjustoIMY>.
- Kraft, Herbert C. 1986. *The Lenape: Archaeology, history, and ethnography*. Newark: University of Michigan. <https://babel.hathitrust.org/cgi/pt?id=mdp.39015013499366&view=1up&seq=7&q1=three%20sisters>.
- . 1986. *The Lenape: Archaeology, history, and ethnography*. Newark: University of Michigan. Accessed April 10, 2021. <https://babel.hathitrust.org/cgi/pt?id=mdp.39015013499366&view=1up&seq=7&q1=three%20sisters>.
- Kraft, John. 2008. *Ancient America: Learning Lenape*. Autumn. Accessed January 2021. https://njskylands.com/hs_lenape_083.
- Lajimodiere, Denise. 2012. "A Healing Journey." *Wicazo Sa Review* (University of Minnesota Press) 27 (2): 5-19. Accessed May 10, 2021. <https://muse-jhu-edu.ezp-prod1.hul.harvard.edu/article/488625>, muse.jhu.edu/article/488625.

- Landon, Amanda J. 2008. "The "How" of the Three Sisters: The Origins of Agriculture in Mesoamerica and the Human Niche." *Nebraska Anthropologist* 40: 110-124.
<http://digitalcommons.unl.edu/cgi/viewcontent.cgi?article=1039&context=nebanthro>.
- Long, Charles H. 2018. "Religious Interpretations of America." Chap. 1 in *Ellipsis: The Collected Writings of Charles H. Long*, by Charles H. Long, 13-24. Bloomsbury.
<https://www.bloomsburycollections.com/book/the-collected-writings-of-charles-h-long-ellipsis/permissions?from=search>.
- Martinez, Rhea Trotman. 2007. *AN EVALUATION OF THE PRODUCTIVITY OF THE NATIVE AMERICAN 'THREE SISTERS' AGRICULTURE SYSTEM IN NORTHERN WISCONSIN*. Masters of Science Thesis, College of Natural Resources, UNIVERSITY OF WISCONSIN, Stevens Point: UNIVERSITY OF WISCONSIN, i - 136.
<https://epapers.uwsp.edu/thesis/2007/Martinez.pdf>.
- Media, Oneida Digital. 2013. *Three Sisters Garden*. December 13. Accessed December 2, 2021.
<https://www.youtube.com/watch?v=SQ4dgTwTpvk>.
- Morales, Reynaldo A. 2017. *An Oneida Elder Speaks About the Three Sisters Garden*. Oneida Nation of Wisconsin. June 8. Accessed December 4, 2021.
<https://www.youtube.com/watch?v=lSwGxJe4bVs>.
- Mouser, Linda. 2001. *Delaware Indians*. N/A N/A. Accessed March 8, 2019.
<http://www.pencaderheritage.org/main/teachtool/indians.pdf>.
- Mt. Pleasant J. 2009. ""The science behind the Three Sisters mound system: An agronomic assessment of an indigenous agricultural system in the northeast"." In *HISTORIES OF MAIZE: MULTIDISCIPLINARY APPROACHES TO THE PREHISTORY, LINGUISTICS, BIOGEOGRAPHY, DOMESTICATION, AND EVOLUTION OF MAIZE*, by John Staller, Robert Tykot and Bruce Benz, 529-537. Amsterdam: Left Coast Press, Inc.
https://books.google.com/books?hl=en&lr=&id=XnelKvUxiCcC&oi=fnd&pg=PR7&dq=Histories+of+maize:+Multidisciplinary+approaches+to+the+prehistory,+linguistics,+bio+geography,+domestication,+and+evolution+of+maize&ots=-kIZKxJB8z&sig=cl_Fbx_VQ_FdQQ4Apzoob9eFcsc#v.
- NSU, Northeastern State University. 2021. *THREE SISTERS LEGEND*. N/A N/A. Accessed May 16, 2021. <https://www.nsuok.edu/heritage/three-sisters-legend.aspx>.
- Piperno, Delores R. 2001. "On Maize and the Sunflower." *Science* 292 (5525): 2260-2261. Accessed November 20, 2019. <http://www.jstor.org.ezp-prod1.hul.harvard.edu/stable/3083864>,
https://repository.si.edu/bitstream/handle/10088/1490/On_maize_and_the_sunflower.pdf.
- Pleasant, Jane Mt., and Robert F. Burt. 2010. "Estimating Productivity of Traditional Iroquoian Cropping Systems from Field Experiments and Historical Literature." *Journal of Ethnobiology* 30 (1): 52-79. Accessed November 16, 2019. <https://bioone-org.ezp-prod1.hul.harvard.edu/journals/journal-of-ethnobiology/volume-30/issue-1/0278-0771-30.1.52/Estimating-Productivity-of-Traditional-Iroquoian-Cropping-Systems-from-Field-Experiments/10.2993/0278-0771-30.1.52.full>.

- Pratt, Mary Louise. 1991. "Arts of the Contact Zone." *JSTOR* (Modern Language Association) 33-40.
<https://www.jstor.org/stable/pdf/25595469.pdf?refreqid=excelsior%3Af658b4169629c3aa2e17305f503acb83>.
- Reed, Paula S., Ph.D, and Edith B., M.A. Wallace. 2019. *A Historic Saga of Settlement and Nation Building: First State National Historical Park*. New Castle, Delaware: National Park Service. Accessed December 1, 2021.
https://www.oah.org/site/assets/files/10217/frst_hrs-_10_11.pdf.
- Robbins, Jo. 2022. *Master Gardener Program: The Three Sisters Garden*. Accessed December 5, 2021. <https://extension.psu.edu/programs/master-gardener/counties/pike/news/2015/three-sisters>.
- Roush, Wade. 1997. "Squash Seeds Yield New View of Early American Farming." *Science* 276 (5314): 894-895. doi:10.1126/science.276.5314.894.
- Rowe, Alesha. 2019. *Native American Warrior*. Accessed 2020.
<https://www.pinterest.com/pin/68750331785404084/>.
- Seldin, Abigail, Robert Red Hawk Ruth, and Shelley DePaul. 2008. "FULFILLING A PROPHECY: THE PAST AND PRESENT OF THE LENAPE OF PENNSYLVANIA." *Expedition Magazine* (Penn Museum) 50 (2): N/A. Accessed 6 Sept, 2021.
<https://www.penn.museum/sites/expedition/fulfilling-a-prophecy-the-past-and-present-of-the-lenape-of-pennsylvania/>.
- Sherry, Lynne, and Kristi Talbot. 2019. *The Legend of the Three Sisters*. Oct 4. Accessed January 21, 2022. <https://www.youtube.com/watch?v=ZCW0sK8OGXE>.
- Smith, Bruce D. 2001. "Documenting Plant Domestication: The Consilience of Biological and Archaeological." *Proceedings of the National Academy of Sciences of the United States of America* 98 (4): 1324-1326. doi:<https://doi.org/10.1073/pnas.98.4.1324>.
- Trouillot, Michel-Rolph. 1995. "The Power in The Story." Chap. 1 in *Silencing The Past: Power and The Production of History* by Michel-Rolph Trouillot, 1-30. Boston, Mass: Beacon Press.
- Watkins, Joe. 2005. "Through Wary Eyes: Indigenous Perspectives on Archaeology." *Annual Review of Anthropology* 34: 429-449. Accessed May 12, 2021. <https://www.jstor-org.ezp-prod1.hul.harvard.edu/stable/pdf/25064893.pdf?refreqid=excelsior%3A3dcf2c2144599121d704bbdab753dbc4>, <https://www.jstor.org/stable/25064893>.
- Weiser-Alexander, Kathy. 2021. *Lenape-Delaware Tribe*. April N/A. Accessed April 25, 2021.
<https://www.legendsofamerica.com/lenape-delaware-tribe/>.
- WFYI. 2014. *Delaware Indians at Conner Prairie*. October 15. Accessed December 2, 2021.
<https://www.youtube.com/watch?v=2qAnmfjzSiE>.