



Native Americans of the Merrimack Valley:

An Annotated Teaching Guide for Field Trips
Large and Small

by

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Introduction

The following pages present a written version of a two-hour field trip designed to introduce children to the culture and history of the Indigenous Peoples of the Lower Merrimack River Valley. It focuses on their lifeways within the ecological realities of the forests, meadows, streams, and coastal shores of what is today called Southern New Hampshire and Northeastern Massachusetts.

This format was originally developed for field trip presentations at Beaver Brook Association in Hollis, NH in 1998. It was eventually revised and expanded for other sites and situations - including weeklong summer programs. The emphasis is on learning about Native American lifeways in this area just prior to persistent contact with Europeans, i. e. in the time period around 1500 to 1600 CE. The geographic focus is on the people and land near the confluence of the Nashua and Merrimack Rivers in present-day southern Hillsborough County, New Hampshire. However, the families who lived here then were part of a larger, distinctive cultural group which extended along the watershed of the Merrimack River from Manchester, NH, to Newburyport, MA and along the Atlantic Coast from York, Maine south to Salem, Massachusetts. At some points in the early years of the 1600's, European chroniclers referred to these people as the Pawtucket, and then later, Pawtucket-Pennacook (spelled in various ways) or the Pennacook.

The content you'll find here highlights the mutually beneficial relationships that the Indigenous People evolved with other living beings of this place / region. The interactions were such that generations of humans were able to thrive here for literally thousands of years. Such lifeways embodied successful, sustainable adaptations to the changing yet patterned flows of sunlight, air, water, and biodiversity that even today weave together eastern temperate forest ecosystems. It is my belief that youngsters living in these locales during the current 21st Century will be well served if their education allows them to know something about the sustainable cultures that existed here across the millennia - and equally important, to value those cultures. An understanding of the lifeways developed by the Native Peoples of this area can provide a useful criterion for today's youngsters as they reflect upon and participate in the activities of their own communities and social networks. This is especially the case as they begin evolving their own generation's deliberate responses to humanity's challenging future.

And while Native American lifeways just prior to European Contact will receive the most attention in the field trip, this overview will also try to convey a sense of the ongoing cultural changes that have been occurring during the wider span of 10,000 years (or more) that Indigenous Peoples have flourished within this bioregion. Additionally, you'll find descriptions of the massive upheavals and suffering that occurred Post Contact, particularly in the 1600's and 1700's, when European settlers expropriated almost all of the Native Peoples' land and waterways. This situation impelled many of the surviving Indigenous People (in the wake of persecution, unfair trade and land transactions, epidemics, and wars) to migrate north. These disastrous events are explained very simply for younger groups, and with more historic detail for older audiences. This narrative also conveys the explicit message that Indigenous People continue to live in this bioregion and elsewhere, and that they are vital participants in today's world. There is a clear acknowledgement that the descendants of these cultures have much to teach prevailing 'modern' cultures and societies, even as they themselves have

adopted much from those cultures and societies as well. Thus, both Traditional Ecological Knowledge (TEK) and Scientific Ecological Knowledge (SEK) will be presented in this field trip. We'll endeavor to pass along scientifically accurate natural history information about the many different life forms whose interactions create this biome, ranging from the readily observed plants and animals to the more more cryptic yet powerful fungi and microorganisms (including protists, bacteria, and viruses) who also have essential roles in this and every ecosystem. At the same time, we'll be looking at these beings in terms of their relationships with the Indigenous People and their traditional ways of living. You'll notice too, how the conversations promoted during this walk feature a concurrent, respectful exploration of human values, aesthetics, ethics, and history - including considerations of contrasting cultural priorities and questions of justice.

By way of context, the programs that grew from and inspired this text were most often conducted on the beautiful grounds and trails of a 1700-acre environmental center: Beaver Brook Association of Hollis, NH. I was privileged to teach there part-time for over twenty-five years. During field trips, I was often able to access a garden site that our team had planted with Native American crops - as well as trails through the forest, meadows, and along several streams. The grounds were also graced by a full-sized reconstruction of a wigwam. In the early years, there was a medium-sized, geographically misplaced, replica of a tipi where groups could gather. I typically complemented the trail's natural highlights with relevant hands-on materials and artifacts (described in detail later) which were carried along on the walk in a splint basket. I also employed a set of original paintings illustrating scenes of Woodland Indian life and a map of presumed territorial boundaries of Indigenous nations at the time of early contact with Europeans. (Reproductions of some of these visual aids are available at evolvingbeauty.org and some are included in this pdf. I was also fortunate to be able to present versions of these field trips / walks in settings including the woods, fields, and 'weedy' fence lines of other locations including public, independent, and parochial schools in New Hampshire and Massachusetts, most frequently at Maple Dene School in Pepperell, MA and Infant Jesus School and St Christopher School in Nashua, NH.

At Beaver Brook, field trip participants ranged from preschool children to seventh graders. They would arrive by bus or car with their attendant teachers and parent volunteers. Tours about the Native Americans of this area were also conducted as special programs for families, homeschool groups, and Scouts. As you can imagine, depending upon the audience, seasons, and the weather, the form and content of each day's program shifted markedly. Even so, certain themes and core data were typically conveyed. The subsequent pages elaborate on this general format - which proved to be very serviceable.

One final note, while I am grateful for the splendid setting provided by Beaver Brook Assoc. lands, I must emphasize that such extensive forests are not a prerequisite for a meaningful fieldtrip. The outline presented here can be readily adapted for other locations blessed with at least a fragment containing a few representative species, large or small, from the original, native ecosystem.

At the outset, I acknowledge that there is far more information included here (both in the outline and the expanded version of the field trip) than could ever be encompassed within a single day's presentation. This abundance of material is offered for several reasons:

The first is to provide clarification, amplification, and detailed documentation regarding topics which are mentioned during a typical field trip. I thought that this could be valuable for teachers who wished to further discuss or develop certain topics with their students after they had returned to their classrooms. To facilitate further research, there is a bibliography, and page numbers are usually noted when citing references.

A second reason is to suggest to other presenters the diversity of topics, background information, and stations, etc. which *might* be included within a morning's or afternoon's walk - given the extant features of a particular setting or the varied questions or interests of a specific group.

Additionally, during a field trip, I've sometimes needed to break up what could become a long, dull trek. An effective way to do this is by pausing to discover and talk about some interesting plant or animal along the trail. Alternately, sometimes it's necessary to slow a group down that's beginning to speed along too quickly. By supplying the youngsters with an engaging focus for their attention, this goal can be achieved – even as they learn more about their fellow creatures within this ecosystem. Logistics aside, it's important for youngsters to get to know specific beings and to begin to understand the complex and varied interactions that Indigenous Peoples formed with so many intriguing species. It's up to you to select which ones seem best to highlight for your young guests.

Similarly, a few trail activities and games are described (even though there's never enough time to use them all). Having a modest repertory of varied activities – in addition to verbal information – allows you to flexibly adapt the walks. Such resources make it easier to keep the program well-paced, productive, and enjoyable. I encourage you to expand and improve upon this initial base!

Field Trip Outline

Now this brings us to the key question: what forms the general content of a typical walk focused on the Indigenous heritage of the Lower Merrimack Valley - recognizing as we do, the inherent mutability and uniqueness of each locale, educator, and set of visitors? From my perspective, I would say that a basic framework could be outlined as follows:

Welcome & Overview:

Explanation of the use of the words 'Native American,' 'Indian,' 'Indigenous People' or 'First Peoples.'

Emphasis on the antiquity of humans' presence in N. and S. America (perhaps dating back as early as 28,000 yrs. ago).

Sharing the names of the Indigenous cultural groups who were living in this region and the extent of

their territories at the time of documented contact with Europeans, 1600 CE, to the imperfect degree that we know them. (*Map**)

Mention of the persistence & importance of N. A. words in today's English language. Acknowledge that these words are just one of many ways that early Indigenous cultures shape contemporary life.

Acknowledgment of the continued presence in this region of actual people with Indigenous ancestry and heritage – including, perhaps, many of the students in the audience – whether they realize it or not!

Description of the ongoing process of migration, adaptation, and innovation among Native American cultures that has been taking place for thousands of years. This process is also part of the story of the settlers from Europe and other parts of the globe.

Time-Line Activity to introduce and reinforce this foundational concept about time scales. This activity employs a 25 ft. long jute rope* where 1 ft. represents 1000 years. The rope / timeline is unrolled by a student to illustrate the chronology of 4 key events: the arrival of the Hunter and Gatherer bands in N. America perhaps 25,000 years ago and their dispersal into S. America as well; the arrival of Indigenous People in NH as the glaciers melted away 10,000 years ago; the integration of new technologies into existing Native American lifeways in this region (ceramics, bows and arrows, and agriculture) some 1,700 years ago; and the arrival of European settlers 400 years ago. (As improved dates become available for these general trends, please adjust the numbers.)

Stone-age Hunters and Gatherers

(Older Students) Paleo-Indian and Archaic Indian Societies combined:

Description of the earliest Native American (N. A.) cultural groups who reached this area; people who employed a 'stone-age' technology similar to that of Paleolithic peoples in Europe, and to hunter and gatherers in other parts of the globe from Africa and Asia to Australian. Emphasis on the fact that **all of us are descendants of ancestors who were hunters and gatherers**. This is true no matter where in the world anyone's family / forebears originated! These ancient ancestors were able to survive and thrive by caring for one another, by sharing and communicating wisdom, and by skillfully using fire, stone, wood, and bone technologies to help meet their needs for food and shelter.

Semi-nomadic bands of hunters-gatherers traveled into N. and S. America from Asia perhaps 25,000 yrs. ago.

Description of how these first Hunters and Gatherers lived in the Americas:

They **HUNTED** and **FISHED** for wild animals.

They **GATHERED** wild plants for food.

They created useful and beautiful clothing and footwear by sewing furs and leather using bone needles and sinew for thread. These garments protected them from the cold, brambles, mosquitos, etc. – and served decorative and communicative purposes as well.

They were skilled in the use of **WOOD, BONE, and STONE TOOLS and FIRE.**

Mention of Native Americans' entry into post-glacial NH, perhaps 10,000 - 13,000 years ago.

These first explorers and settlers were adept at making and using spears and spear-throwers (atlatls).

(Option at this point or on the trails: Hands-on examination of various artifacts including stone points, a model spear, animal pelts, jute fiber net with long handle, antlers, wild foods, cattail-mats, and / or other materials relating to hunter-gatherer way of life.)*

Transition to more 'Neolithic' / Woodland Native American ways of living:

*(Description of a gradual change in lifeways that led to the somewhat more settled and technologically complex patterns characteristic of the **Woodland Period (1000 B.C – 1600 A.D.)** of N. A. Life. This transition to lifeways that are technologically somewhat similar to those of the Neolithic cultures in Europe is described through both words and a set of posters* and a collection of artifacts* such as small ceramic pots, a bow with arrows, and an array of foods from domesticated plants beautifully presented in a decorated ash splint basket. The visual materials are shared either before, during, or after the following narration.)*

The Ancestral Indigenous People living here developed and / or adopted new technologies such as:

BOWS AND ARROWS,

FIRED CLAY POTS / CERAMICS, and

GARDENING AND FARMING which involved deliberate **SEED SAVING, SELECTION, and CULTIVATION** of specific plants. *(For older students: other words could be introduced here including: **horticulture and agriculture, agroforestry, and agroecology.**)*

This transition occurred over thousands of years but was probably **completed in Southern N.H. by 300 A.D. - 1000 A.D.** and continued successfully until such cultural tool sets were expanded further when the Europeans arrived bringing metal knives, axes, guns, wheeled carts, plows, draft animals, written language using an alphabet, distilled alcohol, and other novel introductions (including, tragically, new diseases).

Importance of Native American Agriculture: A Garden Station Visit

Based upon the discovery of how to save and sow seeds, select plants for certain qualities, and generally assist / steward their growth. Gardening and farming represent the evolution of a symbiotic / mutually beneficial **relationship** between people and certain plants (and their pollinators and non-human protectors) plus the living soils that sustain them. These relationships were consciously and intentionally promoted by humans across the generations.

Probably began first in areas today called Mexico or Guatemala (beginning around 9000 years ago).

Was probably a discovery by women, an extension and elaboration of their care for gathered plants: observing and understanding the connections across time between seeds, flowers, and the mature plants that were providing nourishment for them and their families; also observing and understanding what plants required to grow well and persist. (*For older students:* Learning to save and grow seeds is an example of humans developing a mutually beneficial, symbiotic relationship / partnership with certain plants. This relationship could also be cited as an example of co-creation / mutual causality between plants and people within the ecosystem.

Corn, Beans, and Squash - The Three Sisters as an example of companion planting

Cultural Contexts to Harvesting – Robin Kimmerer’s description of the Honorable Harvest

Methods of planting (*agroforestry & agroecology*).

What were some of the results of farming for peoples’ lives / social impact?

Additional stored food provided more calories and reduced the likelihood of winter starvation,

Probable increase in the time spent in one place growing and tending the plants. This may have contributed to the growth of settlements / villages, and

A possible increase in territorial conflict (according to some scholars) because the stored food could become a target for appropriation.

Villages and their Characteristics in this bioregion - as the first Europeans described them (Poster of Village along the River* showing three sisters / polyculture fields and Poster of a Close-up of Village Activities*):

These settlements contained populations of perhaps 100 people but sometime many more.

Villages in our area – approximately 30 along the entire Merrimack River in the early 1600’s.

Housing: arrangements, materials, names.

Close to a source of water - **why?**

Water for drinking, cooking, bathing,

Food (fish – even in winter!),

Good land for farming, and

Transportation.

There were several village sites on the Merrimac near what is today Nashua, and one in the Hollis at the foot of Rocky Pond Hill according to early European and Colonial chroniclers. Emphasize extensive transportation network across the region and continent - both waterways and overland trails.

Review key features of life just prior to Contact Period by looking at the closeup poster of the village. It features people bringing harvested corn back to their homes, cooking with a large, ceramic pot, and constructing a sophisticated canoe. Students might also note the presence of children, observing or participating in everyday activities with their families, and the pet dogs, etc.

Beginning of optional Time Traveler Activity.

Review of Trail Policies / Customs in a Nature Preserve - and for this particular walk.

“Woodlands or Industrial Ways of Life: Then and Now?” Activity: What are some of the things that Native Americans in our area did not use (did not depend upon) in their daily life 400 years ago – objects and entities that we tend to rely upon today? (*Older Youngsters*) Troubles that they might have experienced that we don’t, and vice versa? *Don’t forget the 6th extinction and Climate Change!*

Actual Walk (Featuring a combination of stations and activities ideally including although not limited to):

1. Brambles – shrubs of partially sunny forest edges - delicious summer fruits
2. Maple Tree - Native Americans' discovery of maple syrup
3. Tracks – visual messages full of information about the beings who’ve been in the area recently
4. Observing the Forest Edge for Deer:

Discussion of Deer’s gifts - **food, cordage, skins, & tools.** (You might choose to display the relevant items from the artifact basket to make this conversation more memorable, or you could wait and pass around such articles later)

Careful description of Traditional Native American's **respectful, non-exploitative attitude towards / relationship with their fellow living creatures** (a sense and recognition of kinship). Recite or read Ken Mynter’s Cherokee prayer

Valuing regeneration, reciprocity, and conservation - not waste!

Careful stewardship of the gifts of Mother Earth (not regarded as mere ‘extractable resources’): Ex. the annual burning of hunting grounds to provide deer with good habitat

5. Pokeweed – (*a station only for responsible, older students*) berries providing a chemical substance

for dyes, but almost all parts of the plant are also somewhat toxic at certain stages. Reminder not to consume berries, etc. on this walk! Importance of learning about individual species' characteristics and only foraging in the company of an informed adult

6. White Pine - Dugout Canoe

7. Paper or White Birch

Birch Bark Canoes and Containers

Description of bark harvesting practices that exemplify Native Americans' customary respect for living things and their aversion to wastefulness (from Densmore)

Role of bark in protecting trees

8. Forest Management / Stewardship

9. Oak Tree - photosynthesis, mycorrhizal fungal networks, and armored seeds (nuts)

10. Wigwam - to consider this kind of architecture, learn about how it was made, and by whom; to rest and perhaps discuss and examine *artifacts from the basket

11. Small, trailside Homes and Shelters for other fellow creatures in this ecosystem

12. Stream - to admire scenery and consider the water's destination (underground aquifers, clouds, imbibed by other living beings such as trees, deer, frogs, or people, or, eventually, for some of the water, becoming part of the great Atlantic Ocean!)

13. Passing around the material artifacts and / or listening to a talk about the seasonal round of the Indigenous People of the Merrimack Valley (at the time just before Contact) and / or a Native American story

14. Tipi - not used for regular housing during Contact period in this region! A hunting shelter or birchbark covered home for more northern Abenaki

15. Sweet Birch

to enjoy the fragrance of the wintergreen compounds (methyl salicylate) in its bark,

to appreciate yet another Native American discovery – parts of plant could be used as flavoring and medicine

to introduce the idea of plant communication achieved through volatile chemical compounds such as this

16. Partridge Berry - to consider another plant with medicinal properties. A review of Native American collecting techniques which enabled people to harvest yearly without extirpating the plants being gathered – Grandmother plants and seed scattering

17. Fallen Hollow Log – using our senses to understand what’s going on – knowing a fox is in the area by detecting its scent; discussion about scent marking for animal communication
18. Hemlock – complex networks of varied interactions between multiple species involving dispersal, winter shelter, indirect food provisioning, plant and fungi plus animal and fungi mutualisms (!) as well as direct food chains)
19. Pitch Pine – one of the many plants, besides maples, whose sap was useful to people – in this case as an adhesive and medicine
20. Denning Tree – the contributions dead creatures often continue making to the living
21. Bird Calls - Listening activity and discussion of ways in which Native Americans benefitted from a knowledge of bird calls, songs, and behaviors in daily life
22. Chestnut Sapling – impact of novel predators / tiny pathogens within an ecosystem, short- and long-term.
23. Snack and Storytime
24. Stalking / Listening Game
25. Deliberate, Very Conscious Walking
26. Looking through the Forest – Big Picture
27. Shagbark Hickory – nourishing food from its abundant, well armored seeds
28. Relationships to Other Beings within the ecosystem and the Cosmos at large
29. Wild Grapes – fresh or dried, a significant food
30. Burl – the result of microbial action, could be transformed into beautiful and useful bowls
31. Staghorn Sumac – medicinal beverage, hollow stems for maple spiles
32. Jewelweed – a medicinal annual plant and Poison Ivy

Additional Stations depending upon time, interests, and chosen trail

(If applicable) Ending Time Travelling Activity (upon return to trail's beginning)

Formal Conclusion (including perspectives on Post Contact developments and how we might respond to their ongoing effects)

What happened to the Indigenous Peoples of this region after European Contact in the

early 1600's? Consider impacts of:

- Epidemic Diseases causing deaths and loss of elders, families, parents, children, and peers
- Cultural Disruption and the weakening of traditional belief systems
- Attractive but costly and sometimes destructive new materials (including metal tools, guns, and intoxicants)
- Loss of homelands and water access due to treaties that were not actually understood by signatories or that were signed by people not representing tribal best interests or that were obtained by coercion or simply disregarded by new generations
- Wars - violently enforced land grabs accompanied by destruction of Indigenous villages, fields, killings of combatants and non-combatants - including at times bounties for Native American scalps, imprisonment, and enslavement. Some of the encroaching European colonists also suffered death and destruction of possessions during these wars but to a far lesser extent. Ultimately, the colonists 'won' the wars.
- Persecution, discrimination, and imprisonment even during times of peace
- Flight to Canada
- Assimilation - loss of original culture and absorption into the culture of the Colonists. This could have been voluntary, forced, or a complex mixture of both.
- Persistence

By 1747, the village at the base of Rocky Pond Hill near Beaver Brook was empty, and the Indigenous settlements along the Merrimack River in and near present day Nashua had long since disappeared.

Remind the class that despite these many tragedies, many descendants of the First Peoples of this region are alive today!

Some of the people on this walk may have Native American ancestors and not even realize this.

Other people on today's walk may be of Indigenous descent and be very aware of their vital heritage.

Many Native Americans continue to live in the NE United States and in Canada, and throughout the United States, particularly in West and Southwest, and throughout the continents of North and South America in general.

Encourage children to continue learning about Indigenous Peoples of the Americans and their traditional ways of life both in earlier centuries and current times.

Suggest that considering how well and how long Indigenous Peoples have cared for this part of the world, there is much that everyone living here today can learn from their cultures / traditions. Their ways of life and world views suggest models for living in responsible and creative relationship with this beautiful land and its amazing creatures.

Finish by thanking the group for visiting. You might also express a hope that they'll discover many ways to apply their learning – and that their understandings will help them to live more joyfully, responsibly, and harmoniously within this precious biome.

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General Goals and Guiding Themes

This, then, is an outline of the field trip that will be described in detail in the following pages. At this point, it's fair to ask, why have these particular topics and stations been selected and combined in this way? What are the overarching themes that this walk seeks to communicate? In general, I would say there are **three main sets of objectives**.

I.

The first goal is to increase students' actual knowledge and emotional appreciation of Indigenous Peoples' lives and cultures in this area, past and present. While the emphasis is on life as it was lived here immediately prior to European colonization, information is also included about the earliest Native Americans in the Northeast, as well as about events and changes during the Post-Contact and Contemporary periods. The plants and more-than-human animals who sustained early Native American cultures are highlighted. Children are encouraged to recognize and name these various beings, yet the naming is only a first step. Instead, there's also an effort to acquaint youngsters with these creatures' beauty, their lives, and their varied ecological functions. As students realize how such living creatures provided Indigenous societies with gifts such as food, medicines, clothing, building materials, and teachings across the centuries, we hope that the youngsters will value more deeply both these non-human life forms and the people who managed to understand and cooperate with them (and each other) so effectively across the centuries. It is hoped that by focusing on such common, extant pillars of Native American life (particularly key native plants and animals), students' image of the first Americans and their relationships to this place (which is now also the students' place) will become more immediate, vivid, and inspiring.

In order to better engage the youngsters' interest, I encourage them to pretend that they are Native American children living here 400 years ago. This method seems to make the walk a little more playful and invites children to activate their imaginations. As they identify with their assumed roles, I emphasize the personal, and at times, even survival value of attending to various bits of information presented during the walk. I am convinced that some children listen more intently and remember more thoroughly as a result of this technique. (There's current research available that corroborates this intuition.¹) I also believe that role-playing is very helpful in developing students' empathic understanding of historic and traditional Native American lifeways.²

As a result of both this method and the actual content of the tour (including encounters with the non-verbal charm of the marvelous landscape and its component beings), it is hoped that children will begin to better understand and value the ingeniousness of the Indigenous cultures. It is hoped that they will recognize the deep amount of learning, foresight, and restraint that Pre-Contact Native Americans drew upon as they lived their lives, and, also, the courage, collaborative spirit, gratitude, joy, and artistry that flowed through their everyday ways of meeting their basic needs. The young people will also be learning about Native Americans' on-going contributions to humanity at large. It is my sincere hope that this knowledge - by a process of generalization and transfer - will engender in at least some of the children an enhanced respect for diverse, indigenous societies globally, particularly those that have not been completely overwhelmed by western industrialization and consumerism. An allied, long-range objective of this experience is that children will develop a more

compassionate, informed, and fair view of the ongoing history of the varied lifeways that have emerged and prevailed at various times here in this region - and the lifeways that will emerge in the future. Interactions between the more-than-human components of the biosphere and the descendants of European colonizers, other immigrants, formerly enslaved people, and Native Americans will continue to present an important zone for creative adaptation, competing values, and visions in the years ahead.

¹ Nairne, James S. and Pandeirada, Josefa N. S., "Adaptive memory: Nature's criterion and the functionalist agenda." *American Journal of Psychology*: Winter 2010, Vol. 123, No. 4, pp. 381 - 390

² It is important to acknowledge that this time-travelling technique is not recommended by a significant proportion of educators who believe that it is inappropriate for people of one culture to "pretend" to be people from another culture. There is a concern that such an activity could be patronizing. I feel that if the historic dimension is emphasized and the children are aware that they are pretending to be a distinct group of individuals who lived in a particular area 400 years ago, the process can be salutary and encourage empathy. If introduced effectively, children will not leave the activity thinking that present-day Native American children have lifeways that are the same as those of their ancestors 400 years ago. Just as school children are sometimes encouraged to pretend that they are Colonial children of New England, or the characters in a Nativity pageant, or youngsters of Ancient Rome, etc. as part of various learning projects and dramas, the results of such endeavors does not necessarily have to be offensive to the living descendants of the historical peoples being emulated. Nevertheless, if a teacher prefers to sidestep this potentially controversial teaching technique entirely, that's entirely their prerogative.

II.

This brings us to the second but by no means secondary set of objectives for this field trip - those related to environmental education in general. Thus, as in most walks conducted at environmental centers, a principal goal is to offer children an enjoyable, enlightening interaction with the natural world - with the community of plants, animals, fungi, and microscopic entities who thrive in this biome / place. Like most environmental educators, we attempt to foster children's innate sense of wonder, curiosity, and appreciation for beauty. We encourage them to engage their senses in exploring the world to which they belong and in which they participate. We try to dispel groundless fears even as we pass along appropriate cautions. We try to increase their understanding of individual beings' lives and the resultant tapestry of relationships that characterize every ecosystem. We attempt to model an attitude of respect and protectiveness towards living creatures. Moreover, recognizing that children - like adults - are more inclined to respect and protect that which they value, we try to highlight the amazing gifts these interrelated creatures offer to each other and to the ecosystem at large. We describe the unique roles they play as vital constituents of the forest - from the most obvious creatures (the trees) to the smallest and most obscure (such as the mycorrhizal fungi and recycling bacteria). In sum, the aim is to cultivate children's positive feelings towards nature - feelings which will, with luck, eventually mature into a spirit of gratitude for the biosphere's abundant, life-sustaining gifts, a vigorous conservation ethic, and an energizing sense of belonging within the Earth Community at large (referencing here concepts from Robin Kimmerer, Aldo Leopold, and Thomas Berry, respectively).

Fortunately, these general objectives of environmental education can be well served within the context of a simple walk exploring Native American lifeways. For example, by explaining how the flora and fauna of this region enabled Native Americans to live here successfully for thousands of years, a teacher can easily offer students concrete, tangible examples of the importance of the many different components of the forest. This sort of knowledge appeals to children's egocentric,

anthropocentric frame of mind and gives palpable meaning to abstract generalizations regarding the benefits of diversity within an ecosystem and / or the need to protect our precious woodlands. It also provides children with an incentive for learning to distinguish between the myriad inhabitants of the forest - particularly those that happen to be green! It enables them to recognize the forest as a generous source of sustenance and goodness rather than as a meaningless, boring jumble, or worse yet - a frightening place of hostile Otherness. Additionally, learning about Native Americans' traditional hunting and gathering practices (such as respect for life, reciprocity, and the importance of not being wasteful) reinforces, in a gentle, allusive way, the nascent conservation ethic we're attempting to cultivate.

And perhaps it is not surprising that a Native American walk should lend itself well to learning not just about particular exemplars of biodiversity but also about crucial ecological principles and responsibilities. After all, as Dr. Jesse Jennings, author of Prehistory of North America, (1968, p.112), has pointed out, for at least thirty-five hundred years, the Native Americans living in our area had attained and were "enjoying an optimum adjustment to a generous environment in the Eastern woodlands, a region rich in biotic resources." Therefore, to the extent that we can communicate on these walks something of the Native American's traditional, Pre-Contact orientation towards these living beings, we can offer children insight into a set of attitudes which demonstrably engendered a rather sustainable, symbiotic relationship between people and planet - in at least in this one small portion of the globe. By describing some of these traditional Native American values, we may be able to foster children's sense of interconnectedness with (and responsibility towards) their natural context and surroundings - an essential goal of environmental education.³

³. This is not to imply that Native Americans were always prescient stewards of nature. Indeed, there is serious speculation that the hunting practices of Paleo-Indians were among the factors contributing to the mass extinctions of Pleistocene mammals that occurred in the Americas around 10,000 BCE. Nevertheless, the fact remains that despite (or perhaps because of) these early experiences, Native American cultures eventually evolved sufficient insight into people's roles within their ecosystems to facilitate the establishment of a dynamic equilibrium between human and non-human processes. This equilibrium was such that human life could persist and flourish in the American Northeast for millennia without destroying the essential, supporting biological matrix.

III.

One final set of objectives shaping this walk are those related to a long-term view of the human story and how we as a species function within a multileveled, evolving pageant of cosmic and planetary processes. With this broader perspective in mind, we've deliberately attempted to sketch (albeit roughly) the 'Big History' of cultural transformation which has characterized the past 25,000 years of human activity on this North American continent. The point is to ensure that students gain some awareness of both the antiquity and dynamism of human cultures. They deserve opportunities to think about the process of sequential innovation, diffusion, and adaptation which, in this case, led hunters and gatherers to eventually add agriculture to their repertoire of lifeways, allowing them to also become village-based agriculturalists - environmental conditions permitting. As cultural transformations continue and accelerate to this very day, I think that it's important that children in the United States - like their counterparts in Europe and Asia become very aware of the timeline of human endeavors. They need to learn about the broad sweep of cultural change from the Paleolithic to the Neolithic (to borrow the European terminology), particularly since this pattern, once grasped, can allow them to better understand parallel developments not just in the Americas but on most other continents as well. Passing along an understanding of Big History might help prepare young people

to craft their own futures more wisely. It can equip these adults of the future with insights to better discern and decide what should change when technology changes and what remains (or should remain) constant. It can empower them to better judge which activities and attitudes harmonize well with our human condition as social, animate beings – beings who can only survive thanks to the generous functioning of this complex and mutable planet.

Returning to the Indigenous People of this specific area, today's Southeastern New Hampshire and Northeastern Massachusetts, I cannot describe the evolution of massive city states such as those that arose in Mexico and Central America or in areas of Mississippian Culture in the US (centered around Cahokia for instance). Nevertheless, by systematically contrasting the customs and material productions of Merrimack Valley Native Americans of 400 years ago with those of present industrialized societies, it is possible to highlight some of humanity's most recent technological and social transformations. I try to accomplish this during the group exercise in which we compare "Woodlands and Industrial Ways of Life, Then and Now?" on the lands near Beaver Brook. I look forward to this conversation because it offers me, as the guide, a chance to gauge the visitors' sophistication and interests, and, if necessary, an opportunity to help untangle the youngsters' thinking about Pre-Contact Native American cultures in this region. This exchange is a good time to emphasize some of the many positive (as well as some of the negative) dimensions to non-industrialized Indigenous culture. This is done intentionally in the hope that the children will begin to learn at early age not to equate technological disparity with cultural inferiority (or unworthiness) on the part of the less-mechanized society. As mentioned earlier, one of the goals of this walk is to promote respect and tolerance for stable, traditional cultures particularly those which have achieved a good measure of harmony with their environment. By contrasting life then and now as it might have been lived on this one plot of land, children can begin to discern the amazing spectrum of possible and workable lifeways that a specific environment can accommodate, at least in the short term. Provisioning children with an array of such models not only helps them to understand their history, but it may also help them to adapt more effectively, wisely, and even gracefully to the social and ecological predicaments of the Twenty-first Century.

A Few Notes on Methods

In terms of teaching techniques, the Socratic Method is employed as often as possible to draw out information and to keep students actively involved in their own learning. This can be such a splendid method for generating ideas and engaging listeners. In this guide, you'll frequently encounter a Question-and-Answer format - typically with the same vocabulary that might be tapped for a spoken presentation. While this might not be stylistically optimal, it's one way to pass along certain key questions which have worked well for drawing out children's thoughts and prompting discussions. You'll see these questions formatted in a bold font throughout the text. (I hope they'll encourage you to develop your own.)

Additionally, you'll notice that some key concepts are presented entirely in capital letters or underlined to signal their importance. Moreover, messages specifically directed to teachers and older students are often preceded by a phrase to that effect in italics and / or are enclosed within parentheses.

Also, because I'm very fond of visual aids (such as posters and time-lines) and hands-on materials (including artifacts and trailside specimens), I've highlighted these items with asterisks whenever they're cited during the walk. The efficacy of hands-on materials as teaching tools for children (and probably adults as well) can't be overemphasized.

In terms of supporting materials, you'll find an assortment of free visuals including coloring pages at my website evolvingbeauty.org. These are designed to reinforce many concepts mentioned in the walks. More activities and posters relevant to the Native American cultures of this region are also available at: <https://nhfarmtoschool.org/indigenous-harvest-calendar/>. (I was happy to serve as principal illustrator for this 2020 project.) The graphics can be downloaded, enlarged, and printed. If they're going to be used repeatedly along the trail, I recommend laminating the resulting posters and then rolling them, or, alternately, mounting them on cardboard or matboard and carrying them in a large portfolio with handles. In terms of practical tips for incorporating materials into a walk, one tactic for reducing the amount of toting required is to strategically place the posters and artifacts along the trail prior to the walk – weather and time permitting.

Large posters and artifacts provide more than just a novel focus for children's attention. They also serve as significant visual complements to the auditory presentation. They are particularly valuable for young children (or those for whom English is a second-language) since they transform the presenter's verbal descriptions into imagery or actual objects. When such visuals are lifted out of a portfolio, their novelty refocuses youngsters' attention to the topic. They also assist the presenter by functioning as reminders of content to be covered.

Lastly, as you read this guide, you'll notice that I've tried to find activities along the trail that engage, at one time or another, almost all of the children's senses. Sensory stimuli, ranging from the tactile to the olfactory, enliven a walk and make it much more memorable.

Acknowledgements

Before concluding this preface, I would like to express my gratitude to the many people who contributed to the production of the earliest version of this guide in the late 90's. Besides acknowledgements due to the actual people across the millennia whose cultures are being commemorated here, and then the authors listed in the Bibliography, I would like to mention colleagues at Beaver Brook including Judy Zivic who initiated this project, Nancy Mitchell, Elizabeth Brown, Jason Stone, and Joe Broyles all of whom reviewed various stages of the initial manuscript. I am very appreciative of the guidance provided by Linda Betts Burdick, who was the Education Director of the New Hampshire Historical Society at that time. Ms. Burdick convened a team of four reviewers, who contributed very useful suggestions for resources and revisions, as well as encouragement for the project. Ginny Hoffman, Leonora Isaak, Janet MacFarland, Diane Stone, Winnie Crouse, and many other fellow teachers were inspiring and instructive during this process. The children and teachers who participated in Beaver Brook's Native American programs were of immense assistance.

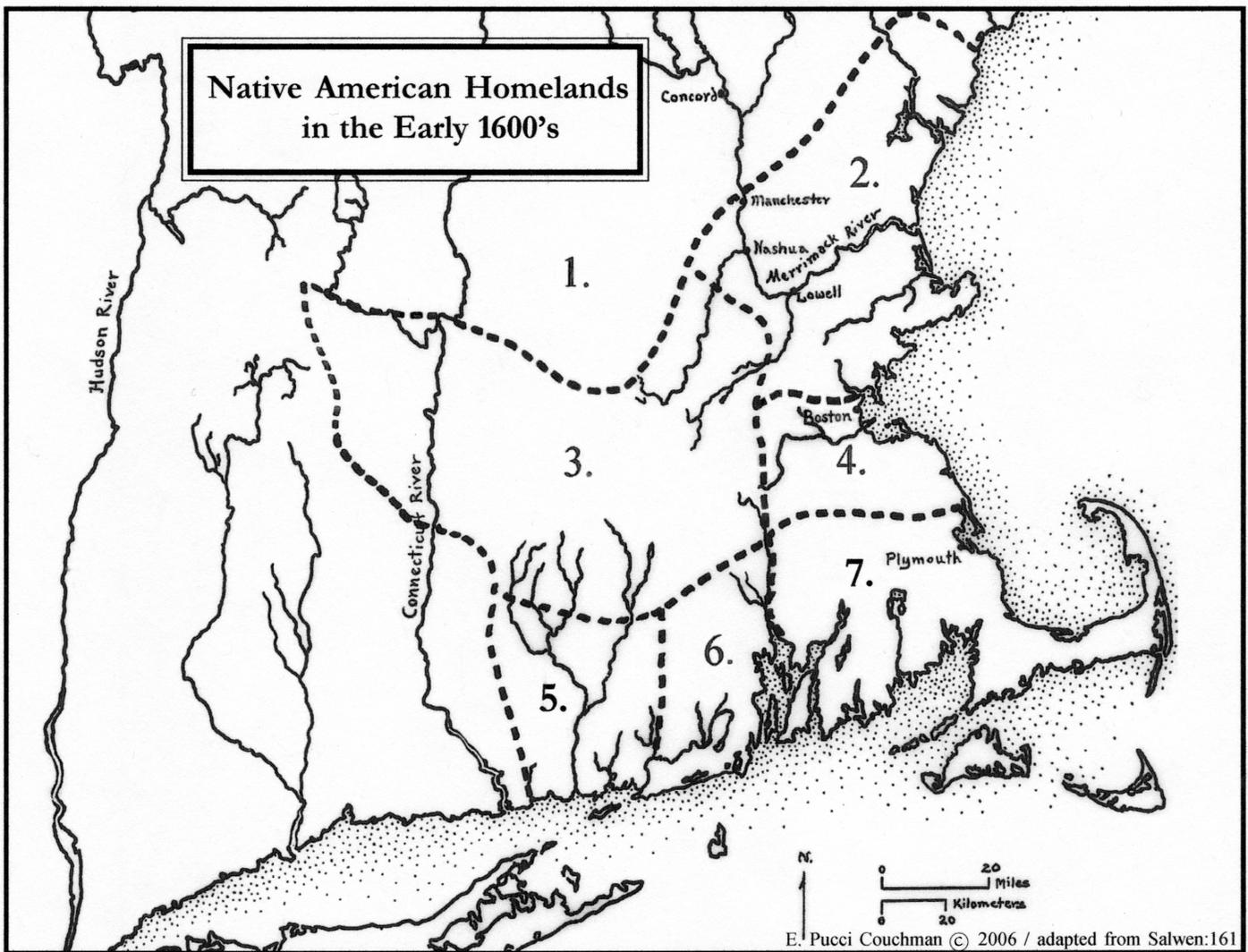
My greatest debt of gratitude goes to my family. They were remarkably understanding and helpful through it all.

A Sample Field Trip Script Focused on Indigenous Peoples of the Lower Merrimack River

Welcome to Maple Hill Farm at Beaver Brook Association in Hollis, New Hampshire. The place where you're standing is located approximately nine miles west of the Merrimack River, two miles northwest of the Nashua River, and two miles north of the Massachusetts state line (Latitude, Longitude: 42.72, -71.61) Today we'll be talking about the people who were living here on this very land some 400 years ago. In all likelihood, this land had been their home and the home of their ancestors for thousands of years - long before the Pilgrims and Puritans and other immigrants from Europe (and other continents) ever set foot in this part of North America.

Who were these people who first lived here? "American Indians" is of course one term that is often used when talking about these people - whose communities and societies had been developing in the Americas for millennia. This name has been applied in part because of a mistake made by a European explorer named Christopher Columbus. **Perhaps one of you can tell us what Columbus' error was in this regard?** (He was a person who committed **many** serious errors!) Specifically, he mistook the islands off the eastern coast of North and Central America for the subcontinent of India - which is more than half-way around the world in Asia! In his confusion, Columbus called the people he found living in these areas "Indians," and this name continues to be used - and to cause confusion - even today. Other English terms are "Native Americans," or the words "Indigenous Peoples" or "First Peoples." These phrases remind us that there were people here long before Western Europeans began colonizing this continent. The last two phrases, "Indigenous Peoples" or "First Peoples" can also be used to describe the original inhabitants of other continents. It is especially appropriate and important to learn what names the descendants of First Peoples use to describe themselves, and which words they prefer when they are noting their ancestral affiliations. Learning and using these names is a respectful way to proceed whenever we're learning and interacting with people of diverse cultures. A look at the accompanying map* (*a poster created from an enlarged printout of the following pdf: <https://evolvingbeauty.org/native-american-territories-in-the-new-england-area-at-the-time-of-contact/>*) should help us learn a few of those names for this area's Indigenous Peoples.

As you can see, many different Native American cultural groups were flourishing in the Northeastern Forestlands in the years between 1500 to 1600. This was the time before Europeans began arriving in large numbers, building homes, and settling. The Indigenous Peoples of this period (in this Eastern half of the present-day United States) are sometimes described in using the term "Woodland Indians" - because, regardless of tribal connections at this point, people's ways of life were interwoven so complexly and beautifully within this largely forested ecosystem. The Native Americans of this area and time can also be named according to 'tribal' groups - to the limited and imperfect extent that we know them. (People in a tribe share similar customs, language, beliefs, and sometimes government. They are also for the most part related genetically to one another.) Sometimes the word "nation" is preferred to the word "tribe," but for today's discussion, we'll keep the term "tribe" for simplicity. This map will show you the locations of various cultural / political groups who were living in what is today called New England in the early 1600's according to Bert Salwen (1978:161). (Salwen was a prominent archaeologist who authored the "Indians of Southern New England and Long Island: Early Period" section of the Smithsonian Handbook of North American Indians.) The main groups in



Directions: Please read the following statements. Using the clues in the descriptions, guess where each of these seven tribal groups lived during the early 1600's. Place the number of the correct region next to the appropriate tribal name.

_____ **Abenaki** – These people were living in the coldest area shown on the map. Since the growing season in their territory was short, perhaps it is no surprise that they relied heavily upon hunting (especially moose hunting), fishing and the gathering of wild plants for food. There are many people of Abenaki ancestry alive and well today.

_____ **Pawtucket (Penacook)** – These people lived along the southeastern portion of the Merrimack River from Manchester, NH to Newburyport, MA. Their territory also included land along the Atlantic coast north and south of the mouth of the Merrimack River. They were skilled farmers as well as hunters.

_____ **Massachusett** – The city of Boston is located on land that once was home to these farming people. Culturally and linguistically, they are thought to have been fairly similar to their neighbors, the Pawtuckets.

_____ **Pokanoket (Wampanoag)** – These people lived around the southeastern portion of present day Massachusetts. They were allies of the original Pilgrim settlers. The initial friendship between the Pokanoket and the English soured as the English colonists began imposing increasingly harsh and unreasonable laws upon the Native Americans. Some fifty years after the Pilgrims' landing, the Pokanoket became embroiled in a devastating war with the English colonists (King Philip's War of 1675 - 1676).

_____ **Narragansett** – This group contained many people in the early 1600's and was very powerful. The Narragansetts tended to dominate the Pokanokets whose territories were to the northeast of their own.

_____ **Nipmuck** – These people lived in the area that is today considered part of Central and Western Massachusetts. Their descendents, like those of several of the tribal groups described here, continue to live in the region and actively maintain some of their traditions.

_____ **Pequot – Mohegan** – These two groups farmed and hunted in lands located in the southwestern portion of this map. Today, some of their descendents are very successful financially in the gaming industry.

Southern New England at that time of early Contact were the Massachusett, the Pawtucket (who are sometimes called the Penacook), the Pokanoket (also known as the Wampanoag), the Narragansett, the Pequot-Mohegan, and the Nipmuck (Salwen,1978:168-172). The lands of Northern New England were home to many people who shared the Abenaki language and culture. From my reading of Salwen's text and map and other available information (which is sometimes complicated and contradictory), I'm inclined to think that the people living on this land 400 years ago were probably part of the Pawtucket tribe, an agricultural group culturally similar to the Massachusett tribe to the south. (For further information on this topic, please check Endnote 1.)

As you can see, Pawtucket territory included a large swath of land stretching from present-day Manchester, New Hampshire south and east along the Merrimack River all the way to the Atlantic coast, encompassing (approximately) the coastal areas south of the Saco River in Maine to Salem harbor in Massachusetts Bay. Daniel Gookin, writing in the late 1600's, estimated that the Pawtucket confederacy of the lower Merrimack River could mobilize a force of 3000 armed men before the epidemics of 1617- 1619. This implies (Salisbury, 1982: 27) that there may have been a total population of 21,000 to 24,000 people belonging to the Pawtucket group living in this territory in the first decade of the 1600's. The 'Penacook' band (who were probably Abenaki) are said to have controlled Upper Merrimack valley through the mid 1600's, during which time the alliance and amalgamation of what were originally two tribal entities along the Upper and Lower Merrimack River accelerated. Already in the early days of European Contact, the Pawtucket people of the Lower Merrimack had accepted the leadership of Passaconaway, whose name, "Child of the Bear," and association with the Pennacooks indicate that he may have been a member of the Abenaki group rather than entirely Pawtucket.

(Older students) Passaconaway was renowned among the English as a great magician and eloquent orator. By the mid-1600's he had become convinced that the best strategy for his plague-decimated people was to maintain a peaceful relationship with the newcomers from across the Atlantic. Passaconaway and his beleaguered but still peace-loving son, Wannalancet, and Wannalancet's successor, Kancamagus, are among New Hampshire's most famous Native Americans (Lottero, 1983:60). Kancamagus, who was both Passaconaway's grandson and the nephew of Wannalancet, eventually took up arms to oppose the unfair treatment and outright persecution that his people were enduring at the hands of the English colonists. <https://www.elibrary.ru/item.asp?id=5508683> Kancamagus was the leader of the memorable attack on Dover, NH in 1689, which was in part in retribution for Major Waldron's treachery against Indigenous People in 1676. During that infamous event in 1676, Waldron and others (on behalf of the British Colonial authorities) had betrayed Native People who had come to Cocheco (present day Dover) to participate in peace talks and strengthen their alliance with the settlers. 350 Native Americans were captured at gunpoint. Some were imprisoned, a few were hanged, and 250 women and children were sent to Boston to be sold into slavery. <https://www.ourbelovedkin.com/awikhigan/cocheco> Is it surprising that Kancamagus became an ally of the French in subsequent wars against the English colonists?

The inhabitants of these lands along the Merrimack River would have been speakers of some variety of the large Algonquian family of Indigenous languages. The term Algonquian refers to a collection of languages related to one another in ways that are similar to the relationships that exist between European languages derived from the Latin language of the ancient Romans, i.e. the Romance family of languages. *(For Older Students and Teachers:* In terms of specific languages spoken by the Native Americans living around Beaver Brook in the 1600s, the Pawtucket are

thought to have spoken a language / dialect that was fairly closely related to that of the Massachusett and Pokanoket nations (Goddard, 1978, as quoted by Salwen, 1978:168). The tribes of Northern, Central and Southwestern New Hampshire spoke Western Abenaki. The people who lived along the Nashua River and its intervals, the Nashuas or Nashaways (Meador, 1869:224-225), were probably members of the Nipmuck nation and as such, may have been speakers of the Loup language. It is worth noting that while the Native Americans who lived near Beaver Brook in present day Hollis, NH may have relied on different languages (and this is an important factor in determining that they were separate tribes), nevertheless all three languages had numerous similarities.

And speaking of language, since words carry not just meanings but also history, let's try to think of some Indigenous / Indian words that are now used in everyday English. **What are some of the names of places, rivers, animals, plants, or things that have been borrowed from Native American languages; from the people who named them first?**

Massachusetts, Nashua, Souhegan, Penacook, Naticook, Pennichuck, Ossipee, Monadnock, Amoskeag, Pemigewasset, Connecticut, chipmunk, woodchuck, skunk, moose, coyote, quahog, muskrat, opossum, raccoon, squash, succotash, tomato, potato, hominy, hickory, hurricane, toboggan, moccasin, Missouri, Mississippi, Iowa, Illinois, Dakota, Utah, Nebraska...

Even the word "Uh huh," which many of us use to mean "Yes," is said to be of Native American derivation (Joseph Bruchac).

(For older students: At the website evolvingbeauty.org, you'll find a printable activity page highlighting a few of the Indigenous words which have been incorporated into the English language: <https://evolvingbeauty.org/native-american-words-in-the-english-language/>)*

Origins: Hunters and Gatherers using Stone and Wood Tools

The Native Americans who lived in this area may have been the descendants of Stone-Age / "Paleolithic" bands of HUNTERS AND GATHERERS. These folks began moving into America from Asia some 28,000 years ago (Snow, 1980:102). Please remember that during these ancient times, everyone in the world was a hunter and gatherer. This is how your ancestors lived whether your ancestors were from Europe, Asia, Africa, etc.!

How do hunting and gathering peoples live?

They hunt wild animals (including fish) for food

They gather wild plants to eat

Various groups of hunting and gathering people are thought to have made the crossing from Siberia to Alaska by way of a land or ice bridge across the channel of water now called the Bering Strait. Others may have reached the American continents later, by way of boat, traveling from Asia or Europe - especially from the circumpolar regions (Jennings, 1968:334).

(Older students) Paleo-Indian is an archaeological term that has been used to describe the culture of the first immigrants to the North American continent. As they settled into this area of eastern

North America (once the glaciers retreated), the term Archaic is used because the cultures were changing and somewhat different technologies were being developed. The artifacts left behind by these Paleo-Indian and Archaic peoples correspond in some ways to the “Paleolithic” and “Mesolithic” tools used by Europeans during most of these same millennia. The word ‘paleolithic’ is an archeological term usually used to describe the oldest stone-age cultures in Europe. It comes from Latin words meaning “ancient” and “stones.” “Mesolithic” is the term for the middle period of European stone-age cultures. That preceded the European Neolithic – the “new stone-age”- when farming, ceramics, agriculture (and certain other innovations) became important, just as they did among the Woodland Indian cultures.

To better understand how long ago all this began happening, let's take a look at a Time Line*. A Time Line is a tool that helps people understand how things happened in time by looking at distances / spans of space. Here, we have a length of jute rope or cord. Let's pretend that the space of one foot on this cord represents 1000 years of time. **Is 1000 years a long time?** Yes, it's rather long – if you're 10 years old, it's 100 times longer than you've been on the planet. Let's have a volunteer from the group, someone who doesn't mind walking a long way, unroll this Time Line to show us how long ago it was that the first Hunters and Gatherers from Asia came to the North American continent. Remember as you watch [name of person] walking with the cord: every foot of distance he or she travels represents 1000 years of time. As you can see, 28,000 years is a very long time and that's one estimate of the length of time that Native American peoples / Indigenous Peoples may have been living in America.

The first people in America were highly skilled in the use of FIRE and STONE TOOLS - including stone knives and stone-tipped spears. Many are thought to have arrived in North America as they followed herds of caribou, mammoth, and mastodons, etc. that were roaming about between Asia and America at this time. *Teachers, please refer to the first illustrated Time Line Card**. Approximately 12,500 years ago some of the early Stone Age Hunters and Gatherers made their way into what is now New England (Snow,1980:150). **Why did it take so long for them to arrive here?** Not only were families walking or traveling by boat along rivers (there were no cars or planes!) but people were stopping to settle in particular places, and then, years later, descendants from the original group would, for various reasons, decide to seek a new place to live.

For thousands of years before 12,500 B.P., no people would have chosen to live in what we now call New England! Back then, this would have been a terrible, almost impossible place for humans to survive. During these years, New England was almost entirely covered with glaciers. **Can someone tell our group what glaciers were and are?** - Immense sheets of ice. In this case, the glaciers had become nearly two miles thick in some areas and they blanketed this landscape for thousands of years. If you had been here at this very spot in those days, you wouldn't have been standing on grass but on ice! You would have been perched on top of one of these huge expanses of incredibly thick ice - an actual glacier. Even today, thousands of years later, all around this region - and even on the trails we'll travel this morning, there is still evidence of these phenomena. If you know what to look for, you can actually see how the land was shaped, sculpted, and transformed by the movement of these massive ‘rivers’ of ice. Interestingly though, by some 12,500 years ago, the climate had begun to warm a bit and the glaciers had begun to melt back into what is today known as Canada. As the glaciers melted away, lakes formed, and lichens and small plants began to grow on the rocks and ground that were now once again exposed to sunlight. Herds of caribou came to feed on these lichens and plants that grew during the brief summers.

And who do you suppose came next? Indigenous hunters and gatherers arrived following these grazing animals / herbivores. They established temporary summer hunting camps throughout the region. As temperatures increased, larger plants began to grow – including trees. Tall forests sprang up and more creatures, including mastodons, mammoths, moose, elk, deer, rabbits, giant ground sloths, and bear were able to live here throughout the year (Snow,1980:117-122) (Wilbur,1978:2). As these animals thrived, the Native American hunters were able to settle here with their families. They began living in these regions all year round. (*Older Students*) The general archeological name for the cultures of these times is Archaic.

Over the course of thousands of years, they continued developing deeper insights and different technologies that changed some of the ways that they lived. (*Older students*) This next phase in the NE Indigenous Culture is sometimes called the **Woodlands Period: 1000 B.C. - 1500s A.D (Braun and Braun, 1994: 60 - 84)**. It's helpful to know that Indigenous Peoples (like people all around the globe throughout prehistory and much of history) learned to survive through very difficult situations by caring for one another and working together. They utilized complex languages to exchange information and coordinate their customary ways of interacting with each other and their supporting, empowering surroundings. They learned all kinds of amazing things about various plants and animals who were also living in this area. They became familiar with places that contained certain types of rocks, clay deposits, or springs of fresh water. They evolved more complex relationships with nourishing plants and animals. They developed new skills that helped them survive well within this changing, more temperate, environment. By 300 A.D. (Wilbur, 1978:27-72) or perhaps as late as 1000 A.D. (Braun and Braun, 1994:72-84), the Native Americans in this Beaver Brook area were leading a very different life from that of their distant ancestors who had first crossed into North America. **What were some of these new tools and technologies that were now part of their lives?**

Refer to Time Line's second illustration.*

They were not just hunting with spears - now they were using bows and arrows.

They were not relying only on wooden containers or stone bowls for food preparation - now they were crafting pottery from fired / baked clay (ceramics)

They were not only hunting and fishing wild animals, and gathering wild plants - now they were deliberately tending and propagating certain foods. They were skilled at farming (agriculture) and gardening (horticulture).

The Indigenous People's new understanding of methods for deliberately growing and storing some of the foods they liked permitted dramatic changes in their way of life. **Can you guess what some of these changes might have been?** We'll talk about these changes and the plants that made such changes possible - in just a few minutes.

(*Older class:* If we think about other Native American societies that were flourishing in the years just before the Europeans arrived, it's important to realize that as successive waves of migrating people had moved across this continent and into South America, they had developed remarkable new crafts, customs, and understandings which helped them relate to the new environments that they encountered, and in which they settled. To appreciate the diversity which eventually evolved among

Native American cultures, you might consider these examples: the Mayans with their elaborate cities, written language, and empire in Mexico and Guatemala; the Kwakiutl of the Pacific Northwest; the Jivaro of the Amazonian rainforest; or the Inuit (Eskimos) of the Arctic regions - each group with their own language, customs, and distinct way of life – adaptations to their unique histories, circumstances, and ecological settings.

Now we'll turn our attention back specifically to the cultures that developed on these lands along the Lower Merrimack River.)

*Turn to the Time Line's third illustrated card**. You can see here on the Time Line that about 400 years ago, another pivotal change occurred in Native American life. Explorers and traders from Europe established themselves here and began to live on these lands too. In **our immediate area, who were the first European settlers?** (*Older Students:* While fishermen and adventurers from Europe were probably here at least a hundred years earlier - and earlier still when we consider Norse outposts – today, we're focusing on those who brought their families and began staying year-round in the 1600's.) The English Pilgrims and Puritans, French traders, farmers, and missionaries, English Pilgrims, Dutch merchants, and many other Europeans came to North America in these years. They brought various new tools, technologies, and ideas. However, they also brought deadly disease epidemics and displacement to the Native Peoples. We'll talk about these events later.

Before leaving the Time Line, please look at it very carefully once more. Think about how the Native Americans took care of this continent, North America, for a very long span of time. Then notice how short the time is that the descendants of the Europeans have been living on this land (together with the descendants of the Indigenous people) - only a brief 400 or so years. Consider the damages to biodiversity and to the health-giving qualities of the air, land, water and even the climate that have occurred in these recent 400 years. When you realize how long the Indigenous peoples lived here, enhancing and regenerating biodiversity (actually evolving new varieties of plants), perhaps you'll understand why it's important that we begin learning from them about ways to live more responsibly in this place on this planet. Perhaps we can emulate some of the values and the practices that they evolved - ways of life that allowed them to live here for so many years without destroying the integrity of the ecosystems that sustained them. These are some of the topics we'll be talking about - and hopefully learning about - during this morning's field trip.

³ Authorities such as Dean Snow (1980:261-261, 307) have rejected the "Woodlands" designations for post-archaic periods of New England Native American life in favor of divisions titled "Early Horticultural (700 B.C. -A.D. 1000)" and "Late Prehistoric." These new categories are mentioned to emphasize the fact that the designation "Woodlands" is no longer the universally preferred term among archaeologists. Nevertheless, for young children, just trying to distinguish between contemporary cultures, very ancient cultures, and early agriculturalists, I think a case can be made for employing the Woodlands nomenclature.

Farming Among the Woodland Indians: A Garden Visit Partnering with Generous Plants

Many Indigenous People were (and continue to be) wonderful farmers. By carefully observing and interacting with the plants that provided them with food and by saving those plants' seeds, Native American women and men were able to develop varieties that produced very nutritious and hardy



Homes and Fields along the Lower Merrimack River -
A Possible Configuration

plants. These plants, such as corn, beans, squash, tomatoes, and potatoes, continue to be tremendously important to the descendants of the Indigenous Peoples - and to other people as well - not just in the Americas, but all around the globe.

Let's go over to the garden now to see some of the plants that Indigenous farmers (who were mainly women) first domesticated / deliberately cultivated. Similar plants would have probably been growing right here in the fields of the Native Americans on this very land 400 years ago.

CORN (*Hold up a mature corn stalk and / or ears of Indian corn.* *) **Who can tell us the name for this plant?**

Corn was a very important crop and the Native Americans were the first to domesticate and improve (from a human perspective) this remarkable plant. Corn was originally a type of wild grass with a seed head only about an inch long. Some 9000 years ago, Indigenous Peoples in present-day Mexico were gathering these seeds for food. Over the years they learned that if they ate only some of the seeds they collected and saved a few to scatter on the ground, they could usually grow more corn to harvest later, even in new places. By carefully saving seeds from the plants that produced the most seeds, they were able to develop corn stalks that produced ever larger seed heads - and thus even more food from each plant. By 1000 B.C., the corn seed head (or ear) was at least 3 inches long (Wilbur, 1978:28) and it was protected by a sturdy husk.

Gradually, knowledge about this new domesticated plant - corn - and other useful crops was shared. And the essential seeds were shared too! Knowledge of how to cultivate corn spread from Mexico to the north and south, from the east to the west. New corn varieties were developed which could flourish in the shorter growing seasons of the northern lands. By the time the Pilgrims arrived, Native Americans in New England had been raising corn for some six to thirteen hundred years - or more. They were growing corn plants which were six- to eight-feet high. These bore beautifully colored ears which were 8 - 9 inches long (Wilbur, 1978: 28). (*Hold up and contrast a variety of 4-inch to 9-inch ears of Indian corn.* *)

The Native Americans celebrated the ripening of the corn in late summer with the joyful Feast of the Green Corn. This festival involved up to a week of singing, dancing, eating, and giving thanks for the beginning of the corn harvest (Russell, 1980:170). The fresh corn was usually boiled (just as we prepare corn on the cob today) but sometimes it was roasted. Mature corn was harvested later and dried for use during the rest of the year. Often the Native American women pounded the dried corn seeds between stones or in a wooden mortar. This produced a powder / flour which could then become the base for a variety of culinary delights. For example, it was sometimes mixed with water, meat, and vegetables to make nourishing stews. On other occasions, it was mixed with water, maple sugar, dried fruit, nuts, and fat, and then baked to make a kind of chewy cake. When Native Americans traveled away from their homes, they often carried a long leather sack full of the pounded, pre-cooked, parched corn. This was either wrapped around their waists or tied onto their back. When the corn in the sack was added to fresh water, it made a "toothsome" (or tasty) meal according to the Europeans who were privileged to sampled it (Russell, 1980:76-79).

As you may already know, the Pilgrims would probably have never survived their first winter in America if they hadn't "found" / actually stolen underground stores of Indian corn put in place by the Native Americans who were living on Cape Cod (Salisbury, 1982:113) (Mourt's Relation, Heath,

ed.,1986:22, 26). Under-ground storage pits or STORAGE BARNS, as they were sometimes called, were customarily built by the Native Americans to hold their food reserves. Tribes stored large quantities of corn, and in the first years of European colonization, frequently sold large quantities to the first European settlers, sometimes selling as much as 500 bushels at a time (Russell,1980:173). Such exchanges were essential for the Pilgrims and Puritans in their early years on this continent, particularly because European crops such as barley did not initially grow well in the New England climate and soils (Salisbury, 1982:117, 143) (Russell, 1980:120).

Many intriguing stories were told by the Native Americans to explain to their youngsters how people first learned to grow corn. According to one tale recorded by Roger Williams, a crow carried the first corn seed (safely stowed in one ear) from the Great Spirit Kantantowit's fields in the far-off Southwest. He also carried the first bean seed (stowed in the other ear) from the same sacred garden. Crow's generosity in this regard was cited as one of the reasons why the Indigenous People of this region had great respect for crows. Thus, even though crows were at times a nuisance, a reverent Native American would never kill one (Russell,1980:148).

BEANS (*Lift up a woven basket or dish filled with many beautiful, colorful beans.* * **What Indigenous crop is this?** *Remind youngsters, if necessary, that they have just heard a clue in the story about Crow.*)

Beans were a marvelous crop. Once the Indigenous Peoples had become serious agriculturalists, many varieties were grown. Dried beans could be stored for winter cooking or the fresh beans could be consumed straight from the garden. The Native Americans were the first people to grow string or green beans. Beans in general provided a good source of protein in their diet, particularly when eaten with corn. As Wilbur notes (1978:33), "Baked beans were here [in New England] well before there was a Boston."

SQUASH (*Hold up a pumpkin, summer squash, and/or a gourd.* *) **What kind of plants are these?** (*Explain that they are all part of the Squash (Cucurbitaceae) family. If this is an older group, you might ask **What types of squash are your favorites?***)

Many kinds of squash were grown by the Native Americans 400 years ago. In our area, they grew pumpkins, crookneck summer squashes, bush scallop squashes, and crane-neck squash - and perhaps some kinds of melons (which are also in the squash family). Pumpkins were enjoyed as cooked vegetables when fresh, and they (and the other squash) could also be sliced and dried for long-term storage. There are accounts suggesting that crane-neck squash were sometimes hung inside the wigwams for later use in winter stews. The Native Americans also grew gourds which were dried and fashioned into excellent ladles, cups, and a variety of containers (Russell, 1980:151- 155).

These three kinds of plants - corn, beans, and squash - were sometimes called THE THREE SISTERS. They contributed mightily to the health and success of Native American agriculture. Often, they were grown together. This was truly a brilliant technique as you'll discover in a few minutes.

CULTURAL CONTEXTS TO HARVESTING

Before we learn a little more about the techniques used in raising these plants, let's focus for a moment on the **psychological and spiritual perspectives** that accompanied harvesting plants in the wild, many aspects of which were /are also transferred to harvesting domesticated crops. Just as

when wild plants were gathered or animals were successfully hunted, it was customary to be mindful and grateful for the gifts of nourishing food that these beings were offering. Whether harvested from intentionally planted gardens and fields, or collected in a forest or marsh, foods were a GIFT from the Earth that deserved gratitude! There were important community wide harvest festivals associated with both wild and domesticated plants, including especially the maples, corn, strawberries, and among some Southern 'New England' tribes, cranberries. Robin Wall Kimmerer's description of the Honorable Harvest in her stellar book, *Gathering Sweet Grass*, conveys key aspects of the types of behaviors associated with - and expected - when another creature was 'taken' for food. Such behaviors and customs transformed the interaction from a 'taking' into a mutually beneficial, reciprocal form of exchange and gifting / giving. You can hear Dr. Kimmerer, who is an enrolled member of the Citizen Potawatami Nation as well as a professor of Environmental Biology, explain these practices in her own words and voice to a variety of audiences on the internet. Here's a link to a visually beautiful and thought-provoking three-minute video about this subject which could be shared with audiences of all ages: <https://www.youtube.com/watch?v=cEm7gbIax0o>

(Teachers, speaking of Dr. Kimmerer, if, for some reason, at some point, your older youngsters are not able to go outdoors to explore, let them watch this video in which Dr. Kimmerer presents a beautiful spring field trip to a state park in Jamesville, New York. Or just watch it yourself, for your own enjoyment and enlightenment! It's an ideal model of how to present a field trip combining Indigenous cultural wisdom (Traditional Ecological Knowledge / TEK), with contemporary scientific ecological knowledge (SEK), while remaining grounded within an energizing emotional context of awe and appreciation: <https://www.youtube.com/watch?v=OxJUFGLPYn4>).

And here's another lecture she delivered at Yale about, among other things, our power to transform perceptions of beings by our speech. She points to the distancing / othering we impose when we use the language of subject & object to describe animate creatures. Rather than referring to them by the pronoun "it," we can employ a phrase such as "this one of our kin" or use the being's more precise common or scientific name. By this simple shift to a more animate grammar, we can begin modeling for our young people a more respectful and attentive manner of relating to our fellow citizens of the Earth Community. https://www.youtube.com/watch?v=ZAH_pqVMZ0Q)

For any of you teaching youngsters in a Catholic parochial school setting, the shift to using Brother Frog, Sister Bear or even Brother Sun is already part of our faith heritage - as interpreted so compassionately by St. Francis.)

Farming Methods

Before planting began, a suitable site was chosen which had light soil. The men cleared the area of large trees and bushes. This was done by means of FIRE, STONE AXES, and lots of hard WORK. Given the difficulty of the process, it is not surprising that once the land was cleared, it was often kept as farmland for generations (Russell, 1980:119, 140) - if the soil remained fertile. In areas where the land became depleted of certain minerals essential for growth, it was customary for the land to be abandoned at least temporarily, so it could restore itself. While these fields lay fallow, new ones were established elsewhere (Snow, 1980:76). For example, Souhegan, the name for the river and valley 6 miles north of Beaver Brook's Maple Hill Farm, means "cleared but worn-out lands" (Russell, 1980:14). Beaver meadows, that result when beaver dams / impoundments fill with silt over many years, were favored spots for planting because they offered good soils and few trees to

clear. Acknowledging this, we would like to emphasize that some Indigenous planting areas were so carefully tended (using mixed species interplanting) that they remained in cultivation for decades.

The next stage after clearing was breaking up the soil. Many early writers reported that this task was accomplished by the women of the village. However, Roger Williams maintained that tilling the soil was a project for the entire community, involving **both men and women, and conducted in a "very loving sociable speedy way"** (as quoted by Wilbur, 1978:30). *(As presenters, it's worth remembering and perhaps sharing with our students that such a description rings true for farming customs in many **nonindustrial societies**. Potentially difficult or tedious work was often accomplished by combining that activity with enjoyable community time. European examples of this include barn raisings, threshing parties, and spinning or quilting bees. Check the 'Communal Work' entry in Wikipedia to see how prevalent this practice was / is traditional nonwestern societies.)*

As to the next phase, all the early chroniclers seem to agree that once the soil had been tilled, women were responsible for the rest of the cultivation. Using clamshell, stone, or wooden hoes, the women mounded the earth into small hills sometimes two feet high, sometimes arranged in rows, spaced 3 to 4 feet from one another. Into each of these hills, they may have mixed several small fish (such as herring or alewives) whose decomposing bodies would serve as fertilizer. After this, the seeds of the THREE SISTERS were planted. One system that was recorded required four kernels of corn and three or four bean seeds on every mound, plus an undetermined number of squash or pumpkin seeds in the sloping portions around the sides (Russell, 1980:139-146, 149-154, 167-168).

This was an ingenious method for several reasons. Remember that these three types of plants were called the Three Sisters. They were said to be like three sisters who didn't fight but instead were happiest when they could all be together. **Do you know sisters like this?** In any case, here's how these three sisters grew – and grow: First, the seeds of corn sprout and the corn stalks begin to stretch upwards. Next the beans sprout. It's important to realize that many kinds of beans are vines, and vines are plants that must have some kind of support if they're to grow upright. As the corn stalks grow ever taller, the bean plants twine about the corn using the corn stalks as vertical stakes. Thus, the corn sister helps the bean sister climb and lift her leaves into the sunshine. At the same time, the bean sister helps the corn. Since beans are in the legume family, a family of plants that host nitrogen-fixing bacteria in specially evolved nodules on their roots, the beans are able to increase the absorbable nitrogen in the soil. Nitrogen is a chemical element that the corn plant requires in generous quantities - if it's to grow strong and tall. By adding this nitrogen to the soil, the beans help the corn to grow better.

And what about the third sister - squash? Has anyone ever grown squash in their garden? Do you remember if squash plants have small or large leaves? They have very large leaves. The squash plants have been growing between the hills of corn and beans. They have been vigorously sending out shoots horizontally in all directions from the sides of the mound, quickly covering the spaces between the hills with their big leaves. These large squash leaves shade the soil around the other more vertical plants and help keep the soil from becoming too dry. Their leaves also crowd and shade out some of the weed plants which would otherwise sprout and grow (Cronon, 1983:43-44).

Once the sowing and initial sprouting of the Three Sisters had been accomplished, the women would carefully remove weed plants from the fields until the young beans, corn, and squash were well established. At this point, the squash plants could take over a good part of the work of weed

suppression. Early and late in the growing season, human sentries would be appointed to keep watch against four-footed or winged raiders - who also appreciated the tastiness of corn. This task was often the responsibility of children or the old people of the village. Little huts were even built right in the middle of the fields to shelter the guardians of the ripening harvest (Russell, 1980:168-171).

(Older Students) Raising several types of crops together (companion planting / permaculture guilds) in such a way that the various species complement each other's needs is a hallmark of Indigenous agricultural systems across the world, including agroforestry. Recent scholarship indicates that the Indigenous Peoples' fields in this region often grew combinations of more than just the 'Three Sisters' described here. For more about this, access these articles about the 'Seven Sisters' of NE Native American farming at these links: <https://thenaturalfarmer.org/article/celebrating-our-ancestral-roots/> or <https://vcgn.org/the-seven-sisters-of-abenaki-indigenous-agriculture/>

(Older Students cont.) Also, intriguingly, Indigenous scholar, Robin Wall Kimmerer has stated that we should not forget a fourth sister who was part of the flourishing garden. That sister was / is the HUMAN BEING who plants, tends, harvests, and conserves the seeds of the other three. That fourth being, the human or humans, would need to be adept in practicing the five R's of indigenous environmental philosophy: Respect, Relationship, Responsibility, Reciprocity, Reverence. These ideas are presented in Dr. Kimmerer's Nov. 17, 2020 lecture for the Confluence project.org and their partners: <https://www.youtube.com/watch?v=ZpLBGK9sYEQ>

(Older students cont. and Teachers) It is important to realize that the Native Americans were not alone in developing sustainable agricultural methods that relied on raising a diversity of organisms upon a given patch of ground either simultaneously or through time. Such methods of mixed planting plus caring stewardship continue to be the hallmark of contemporary expressions of these forms of farming. Contemporary versions of these methods are often referenced using the term Agroecology. Agroecology blends time-honored Indigenous practices (from around the globe) with additional insights derived from the empirical sciences. It's a collection of farming methods, science, and social movements (!) that aim to produce healthy nourishing food while empowering food sovereignty and community resilience. Agroecology (according to its classic – non-coopted - definition), like traditional Native American farming and gardening does not rely upon synthetic pesticides and fertilizers, or fossil fuel-powered, capital-intensive, industrialized methods. It does require human knowledge and attentiveness. It is labor-intensive so it provides work opportunities for many even as it helps restore and sustain distributed communities, soils, water, the atmosphere, and biodiversity. Such small-scale, and yet diverse and intensive farming is considered by many (as described in these UN reports :http://www.srfood.org/images/stories/pdf/officialreports/20140310_finalreport_en.pdf or <https://www.fao.org/3/I9021EN/i9021en.pdf>) to be one of the most promising ways for people around the world to directly produce and access the nourishment they need while respecting, supporting, and harmonizing with the boundaries and capacities of the planet's life support cycles and systems.

(Another option for older classes)

Tobacco *Hold up a leaf. **Can anyone guess what plant makes this kind of leaf?** Yes, tobacco. This was another very significant Native American crop. While today, it is frequently used in cigarettes and e-cigarettes (often with terrible effects upon people's health), Indigenous Peoples in N. America used the leaves of this plant for thousands of years in religious and social ceremonies, and

as medicine. It was the one crop that was usually tended by men (Russell, 1980:158-164).

Native Americans prized tobacco but they did not overuse it - as the Europeans quickly did. It might be worthwhile to compare the effects of tobacco misuse upon the Europeans and the effects of alcohol misuse upon Indigenous People. Distilled alcohol was not part of the social experience of this region's Indigenous Peoples prior to Contact with the Europeans. Overuse of alcohol caused severe problems for the many Native Americans and continues to disrupt Indigenous communities even today. Similarly, the European colonists were not aware of the long-term, negative effects of tobacco overuse. They didn't realize that it could cause cancers and lung diseases. The disturbances and damage that these two substances caused to both Indigenous Peoples and people of mostly European descent are examples of the fact that not all novel cultural exchanges are beneficial to those receiving new products, ideas, or technologies.

Shelter: Villages and Homes

At this point, let's consider some of the gradual changes that occurred once peoples in this area began deliberately growing more and more selected plants in specific gardens and fields.

One change was that communities and families no longer had to move about quite so often to obtain food. While people continued to travel to favorite hunting grounds, fishing spots, maple groves, etc. at appropriate times during the year, they also began staying longer in certain places tending their fields and preserving their harvests. Villages became increasingly prominent as centers where groups might gather to raise crops, store food, and defend the fruits of their labor (Wilbur, 1978:27) (Braun and Braun, 1994:82).

(Poster of a distant village with cultivated fields overlooking a river)* Let's now look at several posters which can help us to imagine how Indigenous towns in this region might have looked about 400 years ago, some 20 or 30 years before the Pilgrims' arrival on these shores. The Native Americans who lived around present-day Hollis at this time built their village near a spring of water at the foot of Rocky Pond Hill. This site was also near Rocky Pond, several miles to the northwest of the Maple Hill Farm grounds (Nichols, 1930:27). There, some 100 - 200 people may have built their homes and gardens (Tinklepaugh, 1989).

The early Europeans who visited the N. American continent reported several different types of villages in this 'New England' area. Sometimes they saw clusters of Native American houses which were surrounded by outlying fields where corn, beans, and squash were being grown. In other locations, they observed many individual homes scattered over a large area with each wigwam seated in the midst of its own gardens. Occasionally they reported seeing walled towns. However, in this area, these may have been a response to the more dangerous conditions that came with increasing European contact.

(For older students) Early writers report that there may have been twenty Native American walled towns or fortresses in present-day New England during the Early Colonial Period (Wilbur, 1978:46). Three of these were located in New Hampshire (Russell, 1980:52, 188). Such walled villages were usually found near the territorial boundaries of distinctly different tribes (Salwen, 1978:166) (Snow, 1980:333) and in fact, most villages did not require such defenses since there was generally peace between neighboring settlements. The terms fortress or "castle" are rather imprecise since they were



An Imagined View of Village Life in 1600 CE
along the Lower Merrimack River

sometimes employed by European observers to describe a walled structure enclosing just one wigwam (or longhouse) or else to describe a much larger walled area – like the “Willows” settlement at Amoskeag (present-day Manchester, NH). When an entire town was a fortress, it was sometimes encircled by a stockade (or palisade) made of the trunks of young trees. These would form a fence 10 or 12 feet high around the village, often with two entrances. The logs used for such walls were about as thick as a man's leg and the base of each was planted 3 or 4 feet below ground.)

While the "average" village may have housed about 100 people (Wilbur, 1978:45), some authorities stress that we really don't know the "average" size. Indeed, the principal villages could easily have held 400 to 1000 people (Snow, 1980:76). In one well-documented case, the large walled village of the Narragansett near Kingston, R. I. contained 500 homes (Russell, 1980:189) and at least 2000 people in 1675. This village was destroyed, and many of its inhabitants were killed in a murderous midwinter attack by the Colonists during King Philip's War.

According to Howard Russell (1980:51-53), villages were established in locations that met several needs. Most were built on hills where approaching enemies could be seen from a distance. Close at hand there had to be a plentiful supply of firewood for cooking and heating. This was a crucial requirement and it was not uncommon for villages to be abandoned every twelve years or so when all the nearby firewood had been cut and burned (Snow, 1980:75). Soil suitable for farming was essential as was a reliable source of drinking water (the former could be skipped if this was only a winter village). A stand of evergreens or a hillside to block the north wind was desirable. Sites along rivers were definitely favored - especially locations on river bluffs or islands.

Captain John Smith reported that there were at least thirty Native American towns flourishing along the banks of the Merrimack River in the early 1600's (Snow, 1980:38). Some of these settlements existed where today we find the New Hampshire towns of Franklin, Concord, Manchester, and Nashua, and the Massachusetts towns of Lowell, Lawrence, Haverhill, and Newburyport, MA (Moorhead, 1931:9).

Specifically, Pawtucket settlements along the Merrimack River where present-day Nashua now stands have been described in several early documents. Homes were located near the confluence of the Merrimack and Nashua River (the latter river then being known then as the Watananock) and at the place where Salmon Brook joins the Merrimack (Fox, 1846:22) (Nason, 1877:61). Mary Hogden (1902:8) cites Captains Johnson and Willards' report that there were forty Native American families in 1652 living in what is today called Nashua. There were also flourishing Native American settlements on the east side of the river (in present-day Hudson) and along the Merrimack River at Reed's Island (Litchfield) and Wickasauke Island (Tyngsboro) (Meador, 1869:224, 236).

Why were river sites chosen? The rivers' role should not be surprising. Indeed, the rivers provided so much more than just water for drinking, cooking, and bathing (sweat baths). The alluvial soils along the river were often excellent for farming - particularly when the soil was sandy and light and relatively easy to clear due to frequent flooding. The river itself was filled with a tremendous food source - FISH. Fish (fresh or dried) were very important in the Native American's diet (Robinson, 1988:50). The fish may also have been used as fertilizer in the village gardens (Russell, 1980:166-167). In addition, the river served as a HIGHWAY- a valuable transportation route. When it was ice-

free, the Indigenous People could easily travel upstream or downstream in birch bark canoes or dugouts to their favorite hunting grounds, to the lakes or ocean for their annual summer trips, or to the various waterfalls where many gathered annually to capture fish travelling upstream to spawn. The rivers also facilitated the carrying / transport of products as well as people. Traveling along rivers (on water or on foot) and across their well-developed system of overland trails, the Native Americans were able to transfer valued trade goods between points as far distant as New England and the Dakotas (Russell, 1980:201).

It is worth noting that such trails, along rivers and overland as well, have been described as "the greatest asset bequeathed by [Indigenous Peoples] to the first Europeans." Additionally, many well-known highways in use today (Massachusetts' Route 2 for instance) follow routes first devised by the Native Americans. (Archer B. Hulbert, author of the 16-volume series Historic Highways of America, as quoted by Russell, 1980:201.)

As you look closely at the first poster, do you notice any fences or barns around the town to hold in cattle, sheep, pigs, or chickens? The answer to this is "no", because the Native Americans in present-day New England DID NOT KEEP ANY DOMESTICATED ANIMALS EXCEPT DOGS and sometimes, HAWKS. The animals that the Native Americans relied upon for food lived freely in the nearby forests and waters. As for the dogs that lived with the people, they were not only well-loved pets, but some also helped with hunting, including traveling in canoes for that purpose. Domesticated hawks were described by Roger Williams. He reported that these had been trained to frighten the crows away from the cornfields (Russell, 1980:56-57, 168).

(*Display the poster showing a close-up of village life*) We might next want to ask: **what were the houses like in the village?** In general, at the time of first contact with the Europeans, most of the Native Americans in our area were constructing wigwams or occasionally longhouses. The wigwams were rounded or oval structures made of wood, which were heated by a central fire burning on hearthstones or in a fire pit. Each was home to one or two families. They were constructed of long upright poles (from saplings) which were dug into the ground after being placed two or three feet apart in a circle or rectangle. The enclosed space was often two to three times as wide as a man is tall - in other words, 12 to 16 feet in diameter or width. The upright saplings were bent and tied together to form a domed house frame. Ropes made from materials such as basswood inner bark were laced horizontally through the arched saplings to link them together and strengthen the resultant building. At its 6 to 8' high center, the house was large enough to allow an adult to stand upright (Wilbur, 1978:42).

Once the structural frame was finished, it was completely covered with 6' to 9' lengths of bark which were overlapped and sewn together with prepared roots from trees such as the black spruce. (As you remember, there were no metal nails!) The overlapping bark panels kept out the rain by serving as giant wooden shingles or clapboards. For the temporary wigwams, which were built during summer trips (and during the flea season too), mats made from cattails or reeds were used to cover the wooden framework. In the more solidly constructed winter wigwams, double layers of mats covered the inside bark panels, thus keeping the interior of the wigwam amazingly warm and dry. The wigwams often featured two doors (facing south-east and south-west) and there was always an opening at the top to let light in and smoke out. The top opening and the doors usually had movable covers (Russell, 1980:53-55).

The long houses of the ‘New England’ Native Americans were not as large as the long houses built by the Iroquois but they were still relatively big buildings. They were the preferred dwellings for the Abenaki - particularly in the winter villages. These buildings were a little like long, rectangular apartment houses with arching roofs. Like the wigwams, they were covered on the outside with strips of overlapping bark. Sometimes there would be 40 to 50 people belonging to related families sharing a 30 by 9 meter building (Snow, 1980:71). There were usually cooking areas for each family group (and associated roof openings for light and smoke) lined up along the middle of the structure (Haviland and Power, 1981:169).

Tipis covered with buffalo skins were not typically used in the Northeast Woodlands. However, the Abenaki of Maine occasionally built homes which had a cone shape. These were covered with mats or long overlapping panels of bark – instead of skins. Such cone-shaped structures often served as temporary shelters during hunting or fishing expeditions (Wilbur, 1978:44 - 45). Thus, it is possible that at times we might have spotted cone-shaped shelters in the woods of Hollis three or four hundred years ago. Nevertheless, it is more likely that we would have seen wigwams.

Looking again at this closeup poster of a village, can you tell us what some of these people are doing? Possible answers: There is a lady cooking food in a large, conical ceramic pot; another woman is grinding corn in a big wooden mortar; some women are returning from the fields with baskets of corn and one is carrying a baby on a cradleboard; there are men making a dug-out canoe and another man is carefully crafting some sort of stone tool. **Why is the little boy watching very carefully as the older person works with stone?** Children learned their skills by observing the grown-ups as they worked. Young people were not confined to a particular school building during the day in order ‘to be taught.’ Instead, they learned what they needed to know by observing and helping their family and the others adults as everyone went about the everyday activities of village life.

And now let's conclude this introduction and begin a walk along the trails.

Trailside Stations and Activities

Time Traveling: To make this walk more interesting, you can pretend that we’re not just walking into the forest – you can pretend that we're all also travelling back into time. If you would like, you can imagine that you're a young person (some 400 years ago!) from the village at the foot of Rocky Pond Hill taking a walk along the trails that are part of your home territory.

“Woodlands or Industrial Ways of Life; Then and Now?” Activity: **If you were indeed moving into an earlier time, what are some of today's (21st century) things and conditions that you would be leaving behind? What are some of the features of ‘modern’ life that the Native Americans here would not have used, needed, or experienced in their daily lives 400 years ago?** (possible answers to be discussed, amplified or stressed as one sees fit: metal tools (except for a small quantity of copper traded from afar), wheeled vehicles, many kinds of domesticated animals, written books, electric or gas-powered cars; cell phones; computers; the internet; airplanes; televisions; fossil fuel, electric, or solar powered heating and air conditioning systems; engines in general - including electrical appliances such as vacuums and refrigerators, indoor plumbing, schools, libraries, hospitals, plastics, guns, high crime rates, prisons, factories, air pollution, ocean dead zones, coral bleaching, 6th extinction of global biodiversity, human-caused global warming,

ozone depletion, sea level rising, massive wildfires, droughts, and flooding from increasingly frequent and intense extreme weather events).

Here's an example of how a teacher might expand on topics raised during this Then and Now activity: "Especially because the Indigenous Peoples of this region had no books or libraries (unlike the Indigenous People of Central America, such as the Mayans), they had to be very skilled at both listening, remembering, and retelling. These were essential skills and dispositions that allowed people to maintain and pass along accumulated knowledge, skills, and values, i.e., cultural wisdom."

Trail signal - Bow Held Overhead (courtesy of Janet McFarland):

During this walk I'll be using a visual signal to catch your attention when there's something special to notice along the trail. When you see me stop and suddenly lift both arms and fists high above my head, please stop and do the same. This will also alert those near to you. Please stay still and look about - and also listen - to discover what's been found or what's happening. If you see something that you would like others to see, or if you have a question, please stop and use this silent signal to catch people's attention. Of course, as needed, we can also whisper "stop and look" to one another.

Many creatures in these forests use not just sound to share information and communicate (as in bird songs and calls), but also silent, visual signals such as the one we'll be using. For instance, when white-tailed deer are startled, they'll often flash the white side of their tails, lifting them high above their backs as they bound away. Similarly, birds such as juncos show a sudden glint of previously hidden white tailfeathers when they take flight. Perhaps these unexpected displays surprise predators or maybe they emphasize the creature's departure to others in their flock or herd, but in either case they do add a sort of visual exclamation point to the situation that is unfolding.

(For younger students: In keeping with our time traveling theme, you could pretend that I'm lifting an imaginary hunting bow when I make this signal - and you could pretend that you are carrying and lifting a bow too. As mentioned, if I have a question for you or would like to point out something interesting, I will lift my 'bow.' If you see something that you would like others to see, or if you have a question, raise your 'bow' and catch my attention or the attention of one of the other grown-ups on the walk.

Remember, because you are young, you probably have excellent eyesight, and are relatively close to the ground. Thus, **you children may make the best discoveries** of the entire trip. Please share those discoveries with the rest of us. When someone gives the 'bow' signal, please pass it along by stopping and doing the same.)

As we travel along the trail, we should be very quiet. **What is one reason why Native American children would have travelled quietly through the forest?** There are many reasons, but one might be to avoid frightening away the forest animals that their family might have been hunting. In general, if we can be SILENT, we have a much better chance of HEARING and perhaps even SEEING the animals around here as they go about their lives. If we make a lot of noise, the animals will be afraid and hide. The ability to keep silent was essential to the Native American way of life and children developed this skill at an early age.

We might also remember here that the trails of the Indigenous Peoples, although they extended for

hundreds of miles, were usually very narrow, hardly ever wide enough for two people to walk side-by-side (Russell, 1980:201). To pretend that you're really on a Native American trail - like the ones that ran along the Nashua or the Merrimack River for example - try walking single file -as people (and wolves!) traveling quietly through a forest often do.

Remember that this is the home to many, many creatures, large and small and we are guests in their homes. Let's remember to do our best to keep everything as it is, not breaking or taking that which is here. Let's carry home from the trailside and the forests only lively and inspiring memories!

CORE GROUP OF POSSIBLE STATIONS

1. BRAMBLES (*Rubus occidentalis*)

If you were a Native American child walking along this path, you would probably be making a mental note of these plants and the spot where they are growing. Can anyone guess why these plants would be of such interest? What kind of plants are they? These fellows, with their arching, silvery branches and many tiny thorns, are members of the Rose family. Their common name is brambles and there are over 200 species of brambles growing in New England.

They are especially interesting because most of these shrubs, in addition to providing wonderful shelter for nesting birds and browse for deer, produce delicious fruit in the summer. The seedy berries are relished by many kinds of animals – including us people! Blackberries, raspberries, dewberries, black raspberries, etc. are all types of brambles. Creatures consuming the fruit spread the plants' seeds to new growing places because the tiny seeds can pass through many animals' digestive systems without being digested. The fruits from brambles such as blackberries and raspberries, etc. provided nourishing food for Indigenous Peoples for thousands of years, and continue to offer food to anyone fortunate enough to gather them in these days. The First Peoples would harvest the berries during the summer and eat some fresh. The rest would be dried and stored away for later. In winter, the berries provided healthful antioxidants, vitamins, energy, and flavor when they were added to a variety of dishes. They were an important ingredient in tasty little flat cakes made from corn flour meal, water, and / or bear oil (Russell, 1980:77).

Although the New England Native Americans knew how to grow their own crops, wild food sources continued to play a vital role in their diet. As we'll mention throughout this walk, they continued to both enjoy and need the wild foods which the land so generously provided. As a young Native American, you would be busy learning where the berry patches were in relation to your village so that you could return in July or August to fill baskets with ripe fruit for you and your family.

IMPORTANT POINT: When we walk through an official conservation area, we must remember that (unless there are specific instructions otherwise), we are to allow the wild plants growing here to supply nourishment to the wild birds and other beings who rely upon them. We humans are not to collect, pick, or eat the various plants that grow here in this preserve.

This is important for two reasons: 1) If you eat the wrong plant, you could become very ill. Not all plants are edible - and some are even very poisonous. This is why you should never eat wild plants

unless you are with an adult who can check the plant in question and identify it as safe. 2) This area is, in fact, a designated "preserve," and many people visit the trails here every week just to see what New Hampshire's forests looked like before people changed them into farmed fields, suburbs, and cities. As we always mention to visitors, we must try not to disturb or harm the plants and animals living at this site because a preserve is supposed to be a safe place where nature's creatures can grow and flourish. If visitors collect things and take them out of the forest, there will be fewer fascinating plants, rocks, etc. left for the next group to discover - or in this case, for the wild creatures to eat. Collecting such things can potentially disrupt the delicate and dynamic balance of nature. Remember, some of the plants here are very rare and others produce only one flower, one leaf, or one berry each year! As a simple matter of fairness and courtesy: "We should take nothing from the nature preserve but memories and inspiration, and perhaps some photos or drawings. We should leave only our foot prints. (And if we're grownups, maybe a donation." ☺

2. SUGAR MAPLE (*Acer sacharrum*)

Hold up a maple leaf, then pat the tree trunk respectfully.* Here is the tree to which this leaf was once attached. **Can anyone tell us the tree's name? - clue: it's featured on the national flag of the country located directly north of the United States. The tree is a Sugar Maple. **If you were a Native American child, why would you want to know where these trees were growing?** You would want to know so that your family could return here in the spring to tap the trees for sap. The maple sap could then be processed into maple syrup and maple sugar.

In actual practice, the adult Indigenous Peoples of this area knew very well where the maple groves were located. The right to collect from particular groves was passed along from mother to daughter, at least according to records from the Early Contact period in Maine. The Native Americans of the Northern Woodlands liked maple syrup and used it to sweeten their foods. They made the syrup into maple sugar (which stored well). They also transformed it into various kinds of candy. The Native Americans were the first people to discover the deliciousness and usefulness of maple products for food. They were the ones who first taught the Europeans how to collect maple sap and boil it into syrup and sugar (Russell, 1980:86-90) (Densmore, 1974:308-333). **How did people learn about the amazing properties of maple sap? Were they first alerted to the unusual sweetness of maple sap when they noticed red squirrels scraping away the sugar crystals that accumulated on damaged (gnawed!) portions of the tree's bark? Did they observe the mourning cloak butterflies sipping the sap that dripped from broken twigs?** We'll never know exactly how this discovery happened, but the Indigenous People were well aware of this tree's delicious gifts and it's not unlikely that attentive observations of other creatures in the forest alerted them to this fact. So much can be learned by carefully and respectfully observing the activities of the more-than-human world. (*Older or more interested students:* 'Biomimicry' is the name that's given to the art and science of learning from other beings and then applying the new understandings to human concerns. Biomimicry has given humans not just maple syrup, but various medicines, coffee, and even Velcro - to name just a few examples of biomimicry in practice.) Indigenous People have also passed along many wonderful stories regarding the human discovery of the maple syrup making. One charming Abenaki tale suggests that the Trickster Manabozho made the tree's sap a little less sweet than it might have been to ensure that his friends, the human people, would not become too lazy (Bruchac and Caduto, 1988:144-145).

A number of different processes were developed by the Indigenous Peoples in the Northeast

Forestlands to produce maple syrup and crystalized maple sugar. Besides preparing the necessary tools, one of the first steps was to obtain the sap. This typically took place over the course of several weeks in late winter and early spring. The sap, which is a little like the blood of the tree, had to be extracted. The English word for this is 'tapping.' The Native Americans were very astute about this and could tap the same trees year after year without injuring the trees' health (Russell, 1980:87). Because the trees are living beings - like us - they are alive, it was / is very important that this tapping be accomplished skillfully! The harvester, using a stone axe, would carve a Y-shaped channel through the maple's bark. A small wooden spout (often shaped from hollow sumac wood) would then be fitted into the lowest part of the Y. As the sap dripped out of the shallow cut in the tree, it would run down the spout and be collected. **Can you guess what kind of containers the Native Americans used for collecting this sap?** - They were no metal buckets or plastic jugs or tubing because, as you recall, the Native Americans at this time used very little metal and certainly no plastics. Instead, they gathered the sap in trough-like hollowed logs or else in flexible containers made of elm or birch bark. Some of these bark containers could hold 2 - 3 gallons of this watery liquid.

The sap was transformed into thickened syrup by either a) freezing the sap and discarding the ice that formed, or b) boiling away the excess water. The sap that was about to be boiled was sometimes placed in hollow logs. Hot stones were dropped into the sap to boil it down to syrup. Alternate systems included big clay pots or large bark containers (that hung from a system of wooden poles) situated over a fire. As the temperature of the sap rose, its water evaporated into the air. The sugars left behind became maple syrup. Further boiling and stirring produced crystalized maple sugar. Sometimes the heated sap would be poured into birchbark molds that had been trimmed and formed into pretty shapes. When the maple sugar solidified, it could be given to the children as special treats. Little birch cones filled with solid maple sugar, sometimes tied together like a clump of berries, were sometimes attached to cradleboards. During the sugaring off process, larger birch bark cones might be filled with snow and then drenched with maple syrup (real snow cones!). Water flavored with maple sugar crystals was sometimes served to special guests during the summer months (Wilbur, 1978:34) (Densmore, 1928:312) and in some more northern and western areas of the temperate forestlands, where maples grew especially well, makoks (special birch containers) filled with solid maple sugar were prized item for gifts. Interestingly, several other tree species besides sugar maples were occasionally tapped for sap - birch and wild cherry trees, for example (Russell,1980:88).

Grateful for the sweet and nourishing abundance of the maple harvest, Indigenous Peoples held festivals during March to celebrate and give thanks for this valued provision (Robinson, 1988:127). Observant Native Americans continue these Maple harvest ceremonies and festivals even now.

3. TRACKS IN THE MUD (OR SNOW)

If you were a Native American child, you might be looking very carefully at the ground along this portion of the trail. **What would you be looking for in all this mud (snow)?** – Tracks, the imprints left by the feet, paws, or hooves, etc. of passing creatures. Observe carefully - and try not to step in the mud (or on the snowy tracks) yourselves! **Does anyone spot a good example of animal tracks - besides those of people?** Use your trail signal if you do and let us know what you've found.

From childhood, Native Americans learned to read the signs which various animals left in the snow or on soft ground: this is called track identification. By studying a set of tracks, they could often tell

not only what kind of animal was in the neighborhood, but when. They could also determine whether these kin were running or walking, searching for food, or stalking selected prey. Those people well-experienced in reading tracks could sometimes even tell whether the creature leaving prints was young or old, injured, or healthy. **What other signs might you look for as we walk through these woods?** Scat, evidence of feeding, nesting, etc...

4. EDGE OF THE FIELD AND FOREST TO LOOK FOR DEER (*Ecotone*)

Why would you be especially quiet and watchful here? Clues: Notice the grassy meadow adjacent to the thick forest. **What beautiful mammals like to eat plants along the edge of this meadow and hide in the forest when they sense danger?** (*Older Students:* This area where two distinctive habitats meet is called an “ecotone.” Such areas are key sites for biodiversity in an ecosystem.) The animal we’re looking for here was / is very important to the First Peoples’ way of life. We’re scanning the forest edge for White-Tailed Deer.

How did deer help this biome’s Indigenous Peoples?

Food: one deer provided about 100 pounds of meat which would be SHARED by many families.

Clothing: the skins were tanned into leather for protective and beautiful cloaks, leggings, dresses, moccasins, etc.

Rope (Cordage): rawhides could be transformed into strong ropes or ties. Deer sinews (tendons) could be made into excellent bowstrings.

Tools: bones were fashioned into needles, hooks, special tools for shaping arrowheads, and even hoe blades. The deer's scapula / shoulder blade was especially suitable for this last purpose. (Russell, 1980:65, 125, 134, 191) (Robinson 1988:43).

Did traditional Native Americans ever just kill a deer for sport / fun and then not use its body for some purpose?

No - a deer was killed only when it was absolutely necessary - and as little as possible of the deer’s body was wasted. People in Native American cultures usually consider themselves to be like brothers and sisters to the other living creatures who share this amazing world with them. Indigenous Peoples had learned not to take the life of these other living beings (including both the plants and animals of the forests) unless there were some very important reasons that made such an action necessary. After a hunt, traditional Native Americans would say a prayer of apology to the dead deer's spirit. They would tell the deer that they were sorry that they had had to kill it but that their family was hungry and needed food and clothing. They would thank the deer for giving up its life for them and then they would bury those few parts of the deer that were not going to be used in some way. Finally, they would burn a small quantity of tobacco in honor of the dead creature's spirit.

Here is an exact quote of this type of prayer from Ken Mynter, a contemporary Cherokee, as printed by Eagle Wing Press and cited in the Concord Museum’s Native American Sourcebook (Robinson, 1988:45):

I am sorry I had to kill you, little brother, but I needed your meat. My children are hungry and crying for food. Forgive me, little brother! I honor your strength, your beauty, and your courage. Whenever I pass this place, I shall remember you and burn tobacco to do honor to your spirit as I do so now. O -neh!"

To make certain that there were plenty of deer, the Native Americans cared for their land in specific ways. Selected areas were regularly burned, sometimes as often as twice annually (Russell, 1980:121, 125). By such burning, the Indigenous Peoples were able to reduce the quantity of understory trees and shrubs in established forests - thereby encouraging the growth of large, more fire-resistant species such as oaks whose acorns were a favorite food for deer and many other beings (Russell, 1980:130). The controlled burns also increased the amount of land covered with perennials and small shrubs. The resultant open forests and sunny meadows provided deer with an abundant range of food including various kinds of brambles with tender leaves and twigs (browse). Such areas also offered hunters ample spaces with clear lines of sight – important for bow-and-arrow hunting. It is worth noting that the resulting hunting grounds were usually not located near the village or its gardens. Frequently they were 10 - 20 miles away (Russell,1980:125). *(You might mention to the youngsters that when we pause to look at artifacts and materials, they'll have an opportunity to see and hold some of the wonderful gifts the deer gave / give to people.)*

5. **POKEWEED** (*Phytolacca americana*) - **POISONOUS**: *Please use discretion in highlighting this plant. I would suggest sharing this information only with responsible, older students, unless you think it's worthwhile to discuss this fellow as a cautionary example of a plant whose mature leaves and berries are toxic. That said, it is a magnificent creature, well worth knowing, and the fuchsia ink which you can prepare from the berries is gorgeous.)*

These large 4 - 10 ft. red-stemmed, herbaceous plants can often be found in autumn, before frost, along the forest's edge.) **Can anyone spot a particularly large, non-woody plant growing near this trail?** When fully grown, it the largest, native, annual plant in this region.

The very young leaves of Pokeweed were sometimes gathered in the spring and used as a cooked vegetable for people after first being boiled with several changes of water. The older leaves were not used because they were / are poisonous! The carefully timed harvesting and preparation of this plant is a good example of how wise and knowledgeable Native Americans had to be in order to successfully follow their traditional ways of life. Such practices are also a good reminder to us all that we should not harvest wild plants unless we know with certainty that they are non-toxic. (Some sources say one shouldn't even touch this plant without gloves.) Over the past 400 years, people who arrived in North America from Europe and Africa also learned from the Indigenous People about the use of pokeweed's very young leaves for food. In some areas, the spring poke harvest became - and continues to be - part of Southern (especially Appalachian) culture.

The dark purple berries on Pokeweed were also collected by Indigenous peoples. They were not gathered as food (because they too are poisonous to people) - but for use as an especially beautiful coloring agent. The English colonists learned to collect these berries for this purpose - and that is why this plant is sometimes called Inkberry (Robinson,1988:54). The ink that's made from the boiled berries is a brilliant reddish purple.

6. **WHITE PINE** (*Pinus strobus*)

Does anyone know the name for this type of tree? You might look at its branches and notice the tufts of long, needle-like leaves. This might give you a clue. This magnificent plant is a White Pine tree. Like most pine trees, its needle-like leaves stay green all winter. For this reason, we can say it's a kind of "evergreen." Like all pine trees, its seeds are produced in cones. Thus, we can also say it is a "conifer" (Latin for cone-bearer).

Now if you were a young Native American, why might you want to remember exactly where a giant white pine like this was growing? (Hint: remember our discussion about river transportation.) A large white pine like this would make a splendid dugout canoe.

Dugout canoes were often made from hollowed white pine logs - although sometimes other trees such as chestnut or elm were preferred. Paddles made from wood from trees such as maples served to push the dugout through the water and to steer. Dugouts were frequently used on large rivers, lakes, or even the ocean. They were useful for carrying big loads and many people. Captain John Smith, one of the earliest English explorers, reported seeing dugout canoes that could carry 40 warriors (Wilbur, 1976:63). The first governor of Massachusetts, John Winthrop, reported seeing one with 80 people on board! Of course, smaller dugouts were far more common. They typically carried 20 people or less (Russell, 1980:197).

Now, imagine again that you're an Indigenous person in this forest five centuries ago, how in the world would you chop down an enormous tree like this and transform it into a dugout canoe? Would you have had a metal chain saw with a gas-powered motor or a steel-bladed ax? No, neither! However, you would have had a very powerful tool to assist you. It's something that we talked about earlier and that you might not think of as a tool at first, and yet it was - and is - one of humankind's earliest and most useful helpers - FIRE. Not only was fire used to warm the Native Americans' homes and cook their food, but it could be used to bring down forest giants such as this.

Additionally, you would most likely be tackling this big job with the help of your friends and family. Being able to work with a GOOD TEAM was extremely valuable and often even fun!

The process for making a dugout canoe was something like this: after a tree had been selected, mud or clay would be plastered around the tree's trunk - starting several feet above the ground and continuing upwards several more feet. This coating of mud would prevent the fires (that were about to be kindled) from spreading up the trunk. Next, the people would start small fires around the tree's base. These would be carefully tended and fueled with moss and little bits of wood. These small, very confined fires would burn through the bark and some of the wood at the tree's base. Then, their flames would be quenched and the boat builders would begin chipping away the blackened, charred wood using sharp, stone-bladed axes. (Cutting through the crumbling, burned wood was much easier than cutting through living wood.) Then the fires would be relit, allowed to burn, doused again, and the additional layers of burnt wood would be chipped away. This was difficult and dangerous work. The cycle was repeated until finally the tree could be felled (Wilbur, 1976:63).

At this point, again using fire and stone axes, the men would burn off the side branches and peel away the bark. Using more burning moss or heated stones, they would light a series of small blazes along the top of the fallen log. By alternately burning, stopping the fires, and then scraping, they would gradually hollow the great log into a boat shape. This was then transformed into a finished

dugout by carving the ends with stone tools and smoothing both the inside and outside surfaces with clamshell scrapers. Finally, additional friends and relatives would be called to help move the heavy dugout out of the forest. The vessel could now be launched into the nearest stream, river, or lake (Russell,1980:198).

Remember that these dugouts were very heavy. Often the big ones served to carry bulky loads such as bushels of grain, a catch of ocean fish, trade goods, or large numbers of people. In a way, we can think of these large dugouts as the water-going equivalents of all-purpose trucks.

As we walk further down the trail, we will come to a tree which was used to make a different kind of canoe - one which was light, small, maneuverable, and perfectly suited for quick family or individual journeys. If the dugout functioned a little like a truck on the river highways, then this other type of boat - a canoe - was a bit like the personal car up here in the northern forests.

7. PAPER OR WHITE BIRCH (*Betula papyrifera*)

Who knows the name for this beautiful white-barked tree? It is the Paper Birch, also known as the White Birch. It is New Hampshire's official state tree and it's one that grows well in cold climates. The Native Americans prized the white birch for its strong flexible bark. This bark was used to make containers for collecting maple sap. Its bark was also used to make other sorts of storage and cooking vessels, dishes, decorations, and even birch bark canoes.

To make a canoe and other items out of birch bark, a tree was carefully selected. This was done at a time of the year when the bark could be most readily separated from the inner layers of wood: in June and early July, according to some sources, or in very early spring until June according to others (Densmore, 1974:386), (Wilbur, 1990:67). Frances Densmore recorded the steps in this harvest in the early 1900's among the Ojibwe (Chippewa). This is a Native American group living in the forestlands of Wisconsin and Minnesota. Densmore reported that reverent Native Americans would begin by saying prayers of thanks to the tree which was giving up its life. Prayers were also asked for strength and protection during the risky process of cutting down the tree. In this regard, the goodwill of the Thunderbirds might be sought. Tobacco was offered to the Sky and the Earth and the Four Directions. Some would also be buried in the ground in front of the tree. Tobacco would be smoked by the people who were doing the harvest, and at this point, there was sometimes also a feast.

Next, the tree would be felled by chopping into one side of the trunk. This technique was employed so that when the tree toppled, it would rest on its own stump rather than falling completely to the ground. The bark could then be removed in strips about two feet wide. These were generally peeled from around the trunk's circumference. Smaller pieces of bark might be fashioned into containers or other useful articles immediately after the tree was felled (when the bark was very flexible). Alternately, the bark might be bundled up and carried home for future use. The wood itself would be used for kindling once it had dried. As with harvesting a deer, as little as possible was wasted (Densmore, 1974:386-387).

To construct a canoe, large panels of freshly harvested bark that displayed few flaws were sewn together as needed with black spruce roots. They were curved (white side in) under and around a canoe frame which had already been built from the timber of a white cedar tree. The bark panels were held in place for further sewing with temporary stakes. Melted resin from the black or white

spruce was mixed with fat and charcoal and applied to the panel seams for waterproofing. The interior of the canoe was reinforced with a lining of thin cedar planks which together with the cedar ribs, thwarts, gunwales, and outwales helped complete the canoe (Wilbur, 1976:64-67) (Robinson, 1980:77) (Russell, 1980:195-197). With the strong cedar frame serving as the canoe's skeleton and the tough birch bark functioning as the canoe's skin, the resultant boat was fast, sturdy, very lightweight, and relatively easy to paddle and steer.

The typical birch bark canoe could hold from one to nine people (Wilbur, 1978:67) with a four-person capacity being about average (Russell, 1980:105-106). Although it was strong enough to carry heavy loads, such a canoe could easily be carried overland / portaged by one or two people when it was necessary to avoid a dangerously rocky stretch of river or to move from one river system to another. (Such portage was much more difficult when the boat in question was a heavy dugout canoe.) Using a birch bark canoe, a hunter and his short-legged canoe dog could readily travel along a small river, avoid its dangerous rapids, and quickly reach their favorite fishing or hunting spot (Russell, 1980:57). The entire family could climb into the birch bark canoe for their yearly summer trips to the seashore - trips made to gather blueberries, ocean fish, and shellfish, and to escape summer's inland swarms of blackflies and mosquitoes (Day, 1978:153).

And while we pause at the birch tree, perhaps we should mention another important point: What happens to a standing, living tree when its bark is removed? If too much is taken, the tree dies! The Native American knew this and were usually very careful and not excessive, if they had to harvest bark from a living tree. Unfortunately, some people today - including children - do not yet realize how important the bark is to trees' health and they peel it off thoughtlessly. This is harmful because the bark is like the tree's skin. When the bark is torn away, the tree becomes vulnerable to infections. Even worse, the inner layer of bark is right next to the tree's circulatory system and this circulatory system can be destroyed when the bark is removed. Thus, if an entire ring of bark is taken from around tree's trunk, the tree usually dies. For all these reasons, please remember not to hurt trees by tearing or knocking off their bark / skin - just imagine how you would feel if someone peeled some of yours! Moreover, if you see someone tearing or knocking off a tree's bark, please explain to them why this is not a good thing to do.

8. FOREST MANAGEMENT AREA

This sign explains how the forest on this hillside is being managed by the people here at Beaver Brook Association. These activities are being carried out according to current theory in forestry and its recommended practices for sustainable conservation. **At this point you might ask: Did the Native Americans manage their lands?** The answer is definitely "yes" (Jennings, 1968:332). As you remember from the discussion about deer, Indigenous Peoples in this region deliberately set controlled fires in certain areas in order to establish open grasslands and woodlands where deer could browse. They also harvested trees for firewood to keep their wigwams warm and their food cooked. They felled trees (by means of limited burning or girdling) to increase growing spaces for crops such as corn, beans or and squash, to increase visibility (safety) around the village, and to encourage the growth of certain plants such as blueberries. These are clear examples of their intentional management of the forests.

It is worth emphasizing that the Indigenous Peoples did not cut down ancient forests merely to sell the timber. (This differs from English colonial activities and those that have prevailed since the

formation of the United States.) (*Older students*) For instance, during the 1600's and 1700's, the English authorities were eager to log the N. American woodlands to facilitate the building of more British Warships. In subsequent years, commercial logging corporations have continued to insist on their right to buy and cut forests (old growth or secondary ones) ignoring the fact that such mature forests with their complex mix of species are performing vital ecosystem functions. In contrast, for the most part, the Indigenous People of the 1500's were felling forest trees only when they needed to construct their homes, boats, or other personal items or to obtain wood for cooking and heating their homes. Their ways of relating to the other living things around them (including the trees) were compatible with the flourishing of old growth forests, and had been for thousands of years. Today after a mere 400 years of forest management by people with non-Indigenous values and world-views, there are almost no old growth forests remaining in this Northeastern bioregion of N. America. It is outrageous yet true, that comparable forests across the globe continue to be destroyed by corporations controlled by supposedly well-educated people who do not appreciate the essential benefits that complex, mixed-species forests provide as they sustain biodiversity, indigenous cultures, and the very life support systems of this planet.

As mentioned earlier, observant Native Americans were and are respectful of their fellow living creatures including trees and other plants. As Joseph Bruchac, a contemporary author and descendant of the Abenakis explains (Caduto and Bruchac, 1988:194), even "when cutting a tree or uprooting a clump of sweetgrass, a [Native American] basket maker gives thanks to that plant for sacrificing its life to help human beings. Tobacco is left in exchange, as a sacrifice." This appreciation for nature's gifts and the accompanying desire to return thanks and sacrifice in exchange for gifts taken - a striving towards reciprocity not exploitation - is a significant characteristic of the Native Americans in their traditional dealings / relationships with their environment – including with the 'management' of forests.

9. WHITE OAK (*Quercus alba*), Photosynthesis, Mycorrhizal Networks, and Acorns

What can you see here on the ground in autumn that the Native Americans might have harvested as food? – acorns! These are the tough, charming seeds produced by the White Oak trees. You can see the trees themselves next to the trail and towering overhead. Look up and enjoy seeing the blue sky winking through the fluttering leaves. Look down, and feel how your feet are being supported by those underground roots even as you stand. Please realize that these oak roots are stretching out beneath your feet perhaps as deep and wide as the branches above stretch out and up. They are part of the vast underground world of soil and rock, together with intriguing multicellular creatures such as moles, earthworms, various insect larvae, nematodes, and the realm of the soil microbiome, a small-scale but fantastically diverse, and teeming community composed of fungi and various single celled organisms such as protists and bacteria. One teaspoon of soil contains more individual microbes (protists, single celled fungi, and bacteria) than there are people on this planet!

The oak's roots are vital participants in the intricate mycelial network that weaves its way throughout this forest's soil, spreading out around the tree and even down into the bedrock. Through the interconnecting fungi of this wood-wide web, individual trees are linked with their direct offspring, other relatives, and even plants belonging to different species. At times, the various plants pass along essential molecules to each other. These include molecules such as sugars and water which are carried along in these underground fungal highways. (*Older children*) Recent research also reveals the mycelial web also carries plant signaling compounds. As we will discuss later along the trail,

these compounds, released by plants under attack, prompt other healthy plants who detect them to boost up their own internal chemical defenses. Such responses can also be triggered by air-borne signaling compounds such as methyl salicylate – the scent we call wintergreen – which we will learn about in more detail when we visit the Sweet or Black Birch tree. The key point here is that the plants and fungi (who are all connected through these hidden, below-ground webs) are actively affecting one another. The plants in partnership with the fungi are communicating – not through words – but through incredibly small chemical compounds. They're also sharing among themselves precious water and food supplies as well as essential minerals that help to keep them all flourishing and alive.

Realize too that these enormous oaks and all the other plants, are living beings who are feeding and growing thanks to their millions of leaves. Leaves are very important parts of plants! Through a set of chemical reactions people call photosynthesis, the green leaves of this oak (and other plants large or small) are functioning as solar panels. They're gathering in the Sun's marvelous gifts of energy, breathing in Carbon Dioxide / CO_2 , drawing up Water / H_2O and mixing all of this together to produce energy-rich carbohydrates / $\text{C}_6\text{H}_{12}\text{O}_6$. Such carbohydrates (which are informally called sugars and starches) feed the growing trees. They also feed the underground mycorrhizal fungi who partner with the plants' roots. These, in turn, are suppling the trees with vital elements and compounds that they've extracted and / or absorbed from the underlying rocks and minerals. Know that the carbohydrates produced in plant leaves are also helping to feed the wonderful forest creatures that we can see – with either our eyes or microscopes. The photosynthesizing plants are forming the basis of the forest food web – nourishing creatures ranging from tiny bacteria, to snails, insects, birds, squirrels, bats, bobcats, deer, and humans, etc. Significantly, some of these creatures also help protect the trees in various important ways.

Amazingly, even as these trees are producing all this food in their leaves, they are also releasing precious Oxygen into the air as a byproduct of their transformation of Water and Carbon Dioxide into Sugars. **And who needs Oxygen to live?** We do! Breathe in and enjoy yet another gift from the oak tree. Even if we're not eating acorns today for our lunch, these oak trees are still helping us all to stay alive. Breath out and you're giving the trees Carbon Dioxide and Water – the molecules that their leaves need to have in order to photosynthesize. What a way to say thank you! What a partnership! (*Older students:* These complementary relationships between plants and animals, between the products of photosynthesis and the products of animal respiration, are just another page in the beautiful and complex story of mutually beneficial symbioses / partnerships that have evolved between living creatures such as plants, animals, and fungi and others on planet Earth across time – an empowering story that we hope you'll learn much more about in the years ahead.

Can each of you pick up an acorn? Look at it very carefully. **Isn't it astonishing to think that many years ago all these tall, enormous trees were just little acorns themselves?** Perhaps they started growing here during a pleasant spring morning some two hundred years ago. When you're holding one of these little living beings - these acorns / oak seeds – in your hands, try to imagine that within this small brown globe, there is enough stored energy and information / wisdom (accumulated across billions of years) to allow the developing seed to interact with its environment and, with a bit of good luck, become a massive oak tree much like its parents.

For Indigenous Peoples here in this bioregion, these acorns have been and are a source of a nutritious kind of flour used for cooking. Because most acorns contain bitter chemicals that discourage certain predators from devouring the seeds, the preparation of acorn flour is a complicated

task. The acorns are mashed to a powder with a mortar and pestle and then boiled with maple ashes. This mixture is then rinsed with water in order to remove the bitter flavors. It's dried and the resulting powder / flour can now be used in baking and in stews. In our area, acorns were most important as a food source for various animals that the Indigenous Peoples hunted. For example, wild turkeys, squirrels, and deer all enjoy eating acorns.

There are other forest trees that produce delicious armored seeds and these were also significant food sources for the First Peoples. The common English word for such tree seeds covered by tough outer coats or shells is 'nuts.' The Indigenous Peoples of this region harvested many kinds of ripe nuts in autumn and used them as treasured ingredients within their cuisines. Some of the most important include: butternuts, walnuts, hazelnuts, beechnuts, hickory nuts, and chestnuts. All of these are tasty, nourishing, and storable. Moreover, unlike acorns, they do not require any difficult preparation (aside from cracking the shells!). Chestnuts were especially productive in these temperate forests and they were well-loved not only by humans but also by bears and passenger pigeons. Unfortunately, as we'll mention - if we have time to stop by the chestnut saplings, a fungal blight from another part of the world almost exterminated the native Chestnut trees. This disaster, which seriously altered the species composition of the NE's forests, almost obliterated the mature chestnut population during the first half of the 1900's (Russell, 1980:82-83).

10. WIGWAM

As mentioned earlier, the typical Indigenous homes in the Beaver Brook area (at the time of Contact) were probably wigwams. These homes were circular or rectangular in terms of floor plan and they featured arched or domed roofs - not pointed or conical. At Beaver Brook Assoc., we had a fine replica of Contact Era Native American wigwam. The materials used for such buildings in the 1600's were reported to include Poplar poles for the frame and White Birch, Elm, or Ash bark for the outer shingling. Black Spruce roots stitched together the many bark panels. Basswood tree's inner bark provided the lashings that held the frame and panels in place. Pine rosin / pitch mixed with ground charcoal (from burnt wood) served as the sealant for water proofing and patching small holes in the home's sewn bark outer shell.

The winter wigwams were more robust than those built for summer living. The winter ones sometimes featured branches piled up around the exterior base. These supplied extra insulation. The interiors were also lined with several layers of beautiful, patterned woven mats lining the interior to block drafts and retain warmth. The entrance to the wigwam would have been through either of two doors located on the southeast and southwest side of the building. In the summer, the doorways might have just been covered by a large tanned deer or moose skin.

If we were invited into the home of an Indigenous family some 400 years ago, we would have immediately noticed the central cooking and heating area. The fire there was usually not resting directly on the earthen floor. Instead, it was kindled upon a base of field stones. Baked clay / ceramic or bark cooking pots, sometimes held in place by a system of wooden supports, might have been seen boiling merrily - perhaps filled with a fragrant stew. (In dry weather during the warmer months, such cooking would have been accomplished outdoors.)

Would we have seen any furniture in the wigwam? Yes! (At this point, a poster sized painting of an Indigenous family inside a wigwam might be shared.* This should allow the youngsters to better



Imagined View of a Family in a Wigwam,
in the Mixed Forestlands
of the Lower Merrimack River Valley
around 1600 CE.

envision the interior - which you'll also be describing in words.) Low wooden structures about 12 to 18 inches high (similar to platform beds) would have extended from the walls and partially encircled the central hearth. These would have been covered with woven reed or cattail mats (functioning as mattresses), and upon these there would have been piled many soft furs. The raised platforms served as sofas during the day and as beds at night. Stowed under the platforms and hanging from the walls, we would have seen baskets containing food, medicine, extra clothes, and sewing and hunting equipment, etc. A two- to three-foot tall mortar (perhaps made from a hollowed hornbeam trunk) might have occupied a space in the winter wigwam. There, the women of the family would have freshly ground the corn and other tough foods (such as nuts) that were among the ingredients of their daily meals.

While some early European explorers complained that the interiors of the wigwams were dark and smoky, others noted that the wigwams were remarkably dry, draft-free, and warm (Russell, 1980:54-56). Their appeal as housing was strong enough that Puritan colonial authorities imposed a law prohibiting English settlers from constructing Native style wigwams (Wilson, 1998:86).

11. HOMES AND SHELTERS FOR OTHER FELLOW CREATURES IN THIS ECOSYSTEM

At any suitable point along the trail, ask the children: **Can you find signs of tiny shelters built by creatures other than humans?** These are the 'houses' of other residents of the forest. **Can you spot little openings next to fallen logs, brush piles, or stumps?** These are the doorways to various underground homes which have been built by forest beings such as chipmunks, mice, red squirrels, and others. The entrances lead to burrows which sometimes have several rooms and are often quite complex. (Share a poster of the interior of a chipmunk home*), if the schedule permits. Try to cultivate an awareness that, at heart, forest creatures are our relatives, and many, just like us, deliberately build homes that enable them to live their lives more safely and comfortably. For example, chipmunk homes usually have a sleeping chamber and then additional rooms for food storage and 'toilet' functions. The chipmunks often build multiple entrances to their subterranean shelters - although usually just one is actively used and the others are camouflaged with a light mix of soil and debris (Wishner, 1982:94). Should an enemy, such as a weasel, charge into the chipmunk's burrow, the chipmunk can often escape by exiting through one of these extra doors. Later, inside his or her underground home, the chipmunk can rest tranquilly in one of the underground rooms on a bed of leaves with a few nuts stored underneath for snacking. More seeds and nuts will be piled in other connected storerooms. During the winter, the torpid chipmunk can stay cozy inside his or her underground shelter, sleeping and waking - but not really hibernating, while outside the deep snow drifts and the north wind howls.

(Try to expand on this topic of animal architecture (and the shared nature / characteristics / goals) of humans and other beings whenever the opportunity presents. Challenge the children to search for hawks' or crows' platform nests in the lofty treetops, signs of squirrels' dreys, tent caterpillar webs, or bald-faced hornets' paper homes hidden among the tree branches.)

12. STREAM

As we cross the stream, you might listen for the sound of water splashing around the rocks and enjoy the spectacle of light sparkling on the ripples. **(If at all possible, give the children ample time to look and play around the edge of the stream: ideally exploring up and down its banks. If this can't be**

done because there are too many youngsters in the class or if too many people in general have been repeatedly using this area (jeopardizing the survival of streamside plant communities), at least allow the children to toss leaves or small sticks off the little bridge or from the stepping stones. Encourage them to observe the leaves floating downstream.) Feel free to select a fallen leaf from last year's growing season and drop it into the flowing stream. Sometimes they will float away in the current. **Where are these leaves - and certainly the water - going?**

(Invite them to wonder about this, and then, when the youngsters are tired of tossing leaves and / or exploring, gather them together and pose the question again, this time asking students to voice their speculations aloud. By way of student answers or teacher narration, try to convey the following vital concept, changing the chain of waterways to reflect the water's actual path.)

The leaves will probably be caught on a stone or submerged branch and sink into the water. Little decomposing organisms will eat them and eventually, they'll turn back into the soil over which the water flows.

In contrast, the water has a longer and even more exciting journey. It's on its way to Beaver Brook itself, then from there into the Nissitissit River flowing through the nearby town of Pepperell. From there it will travel into the Nashua River, then along to the broad Merrimack River, and at last out into the vast Atlantic Ocean! Water tends to flow downhill to some sort of larger body of water. In the Merrimack River watershed (where we're standing today) this destination is the mighty Atlantic Ocean.

Of course, as the water travels along, some of it will be taken in by the roots of trees and other plants. Some will be sipped by thirsty animals. Some will evaporate into clouds. Later, the evaporated water will fall to earth as rain in distant places. Nevertheless, a portion of this water flowing through this very forest may travel all the way down to the Atlantic Ocean. Next summer, as you visit a favorite beach on the N. Atlantic seashore, drops of water that passed through these woodlands may indeed be swirling around your feet!

The Indigenous People of this region would travel in their canoes along interconnecting waterways and watersheds. They would set up camping sites next to the rivers or streams along the way. William Woods reports that a common route extended from the Merrimack River in present-day Southern New Hampshire to the smaller Shawsheen River and then, following a short portage, over to the Ipswich River and from there to the beaches along the Atlantic coastline on or near Cape Ann. This type of village-wide move to a seaside summer haven was an annual seasonal tradition. During the early post Contact period, this same route and others nearby were, for a time, crucial for transporting furs and exchanging trade items with the European colonists.

If you were a Native American out on a hunting expedition, why might you choose or not choose a place like this for your campsite? - Such a spot provides a source of water for drinking and cooking. It is accessible by canoe and easy to locate. If the stream were deep enough (which this stream is not), there might even be good fishing.

13. PASSING AROUND OBJECTS FROM THE ARTIFACTS AND MATERIALS' BASKET

At some point during the hike, you'll want to share samples of various artifacts, replicas, and

contemporary works of Indigenous art.* The hands-on sharing of materials can be accomplished at any convenient and picturesque place along the trail - or inside the wigwam or classroom. Here are some detailed notes which we hope might be useful as you craft a sharing activity for your students.

I often offered this activity in two parts to emphasize the chronological sequence of such objects in Indigenous life in this bioregion.

Part I: a Hands-On Examination of some Foundational Artifacts of Material Culture Characteristic of the early Hunter and Gathers (*Paleoindian and Archaic cultural groups*)

To facilitate the discussion and eventual passing around of the materials, invite the youngsters to sit in a circle. As we begin looking at a few of the stone tools, emphasize again that everyone living today is a descendant of ancestors (from all the continents across the globe) who were ‘Stone Age’ hunters and gatherers for tens of thousands of years – that is to say, for the vast majority of time that our species has been ‘human.’

A. Fire-making Tools

*I usually begin the description of various types of stone technology with a strike-a-light kit. This consists of a lump of sparkling iron pyrites accompanied by a smooth piece of chert. I store these items in their own small, hand-woven, lidded container made from plant fibers. Inside the container I also keep a little clump of dried moss or shaved birch bark. You might also prefer some dried bits of birch tree fungus, *Fomes fomentarius*, also known as hoof or tinder fungus.* I explain that the iron pyrites together with the chert are two types of rocks that can serve as useful tools to make yet another tool. I ask the children: **Beginning with these two objects, the iron pyrites and chert, what could we make?** As a hint, I tap the rocks together. Once the children answer: “Fire,” the talk continues concerning the vital importance of fire to our ancient ancestors. **How was Fire helpful?**

- not only to keep people from freezing when the temperatures dropped
- but to cook food,
- to ward off other animals,
- to change the land,
- and to craft certain other tools.

These are all topics that can be revisited in more detail at later stations along the walk.

I often mention how observant Indigenous People must have been to notice the differences and similarities in various rocks that they found and to discover the unique or shared characteristics of these diverse objects.

Sometimes, it can be worthwhile to dramatize the preliminaries to strike-a-light fire-making. I don’t actually ignite the tinder, nevertheless, the children are intrigued as the dried grass (removed from the container) is piled up together with birch bark fragments or bits of shaved bark or tinder fungus to accommodate a spark. Demonstrate the striking of the iron lump with the sharp piece of chert or flint.

That impact breaks off tiny pieces of iron that oxidize / react chemically with oxygen in the air almost instantly, thus generating the very hot sparks. I demonstrate how a fire can be created and sustained by the addition of dry grass, twigs, and finally larger pieces of dry wood – all of which will power / feed the ongoing chemical reaction and accompanying fire. (*Older Students*: To explain the process in more detail, you might mention that the high initial temperature of the spark (that was created by the sudden oxidization of iron) began the chemical reaction between atmospheric oxygen and the complex carbohydrates that are the constituents of the leaves, the dried fungus, or of course, the wood. The resulting chemical reaction (also known as combustion) yields heat and light - or to use one word: fire. It also generates other chemical products. The products from the reacting oxygen atoms and carbohydrates are carbon dioxide and water vapor – as long as plenty of oxygen is present. If there isn't enough oxygen, the products will be, in addition to water and carbon dioxide, pure carbon and carbon monoxide. If no oxygen is available, the reaction will stop completely and the fire will go out! The latter is easy to demonstrate back in the classroom using a lit candle burning under a clear glass that blocks the entry of fresh air. (It was so surprising to me to see how fascinated students were to learn about fire!)

I mention that there were many different techniques for starting fires in different indigenous communities at different times and in different circumstances. The key takeaway is that knowing how to make fire was a tremendously valuable learned understanding. It was also a skill that required some practice, and sometimes it could be accomplished using special types of rocks together with flammable plant materials. While necessary for everyday life (especially in the winter), fire could be potentially destructive if not used wisely, and that's yet another message that students should learn.

B. Stone and Wooden Tools in General

Bring out more samples of tools, as available, that can be displayed, explained, and passed around. The tools might include actual artifacts or replicas (explain that term's meaning) of axes, gouges, scrapers, spearpoints, arrowheads, etc. Production techniques can be mentioned including: percussion flaking, indirect percussion, pressure flaking, and grinding. At the end of the sharing phase, several of these techniques can be demonstrated. Alternately, the intriguing physical qualities of the various types of stones – including their colors and textures (such as buttery, smooth, granular, pocked, etc.) can be emphasized, and then be experienced and named by the students as they pass around the samples (Robinson, 1988:31 – 38). For background, resources by Barbara Robinson and Keith Wilbur contain very engaging, detailed drawings and information about the many stone-working techniques just cited here, including a list of specific kinds of minerals and rocks that Indigenous People discovered and valued (Wilbur, 1978,1998: 112 -115, Robinson, 1988: 43-54). The geographic locations of some Eastern Native American quarries are even listed in Wilbur's Indian Handcrafts book, p.15.

I usually mention to the children that seeing and holding an actual artifact is an experience that is very precious and even mysterious. They should exercise care and respect. If they are encountering an actual artifact, they should realize that they are holding in their hands the work of a skilled craftsman. Amazingly, although the artist who made these objects may have lived hundreds of years before they were born, the beautiful, useful products that that person created can still be appreciated by those of us living today!

Ask them to notice the varied surface marks and contours / outlines of the finished implement.

Consider how all this formed an enduring record of the craftperson's decisions and skills. Help the children realize that the work of this unknown artist's hands, head, and heart became a gift that has travelled across time to those of us who live in the present.

I invite children to imagine: **What kind of a day was it when the craftsperson was shaping this tool? Who was the person who actually made this artifact? What was their life like? Where were they doing this work - in a wigwam or a stone quarry, in a village or by a stream? Were they working on this tool alone or in the company of their family and / or friends?** Even though we will never know the answers to these questions, it is worthwhile to consider them so that we can better understand how these tools reflect the lives and culture of the First Peoples in this region. We can think of the maker of this tool with admiration, and perhaps even gratitude for the artistry that he or she delivered into our lives, even as that person went about their everyday tasks of creating the essential tools that were needed for their lives.

[Gerard Rancourt Tsonakwa's "Reflections: Stories of Creation" audio tape contains extremely powerful stories and first-person narratives about both traditional and contemporary N.A. art-making. These were much appreciated by students (mostly 9- and 10-year-olds) during weeklong summer programs about Native American culture and history in today's southern New Hampshire. Such recordings could - and can - be played while the youngsters are occupied with quiet artwork such as beading, coiling pots, twining a mat, weaving baskets, making jute nets, etc.]

Finally, I challenge the youngsters to think about **who used the finished tool across the years and for what purposes?**

Following a viewing of the tools and the discussion, a quick demonstration can be made of possible methods for creating small replicas inspired by the stone artifacts in the collection. Explain the pecking method of toolmaking and the later invention of pressure flaking using the tine of a deer antler. Demonstrate how some of the tools were used - particularly the spear and the scraper (crafted for removing muscle and other tissue from the inside of hides that are being transformed into leather or fur pelts). Talk about how spear points were often hafted onto wooden handles and the use of sinews for this purpose. Lift up some samples. If available, show a small hand-held fish net made from a freshly cut sapling and jute netting (an enjoyable project for students to make during summer programs). You can also show students an easily constructed replica of a long wooden fish spear featuring sharpened prongs. Mention that many tools from the early years were probably made of wood and fibers that have not been preserved in the archaeological record. Share with the youngsters a contemporary, commercial wooden bow and arrow. Remind them once again that bows and arrows were a relatively recent tool in Native American tool kits - perhaps becoming commonplace only 2000 (!) years ago. -As you'll notice in these commentaries, we're constantly trying to expand children's sense of time.

[Please check the Appendix for instructions for another favorite summer program activity: student projects in which the children craft small versions of specific projectile points, awls, etc. from readily available NH shale.]

While passing around artifacts, depending upon the time and interest of the group, I sometimes ask students to also ponder the question: **What enabled our ancestors to survive not only in this region - but also in so many other regions all across the planet? Was it ONLY the knowledge of**

how to make and use tools like these – or was there much, much more to this story?

A possible answer: Although these tools / technologies were very important, they wouldn't have been much help if people hadn't also been inclined to LOVE AND CARE FOR ONE ANOTHER in their bands of families, neighbors, and across generations. Significantly, they had also developed WAYS OF LIFE THAT HARMONIZED RELATIVELY WELL WITH THE COMPLEX PATTERNS OF SPECIFIC ECOSYSTEMS. They were not destroying the biosphere that gave them life, instead they were grateful for its abundance and sought to maintain a good relationships with the more-than-human life forms and phenomena that surrounded and sustained them. It's also true that from earliest infancy they were participating in the time-honored customs and ceremonies of their families and communities. These helped them to absorb the values and understandings that allowed their way of life to flourish. (*Older students*) From generation to generation, cultural traditions were being effectively transmitted even as new insights and adaptations were emerging and being assimilated. The everyday life of the Indigenous Peoples afforded plenty of occasions for learning, play, and socializing. The children were not segregated into separate school buildings for much of the year as they sometimes are today in this region. Instead, they were enjoying many opportunities to be part of their communities' daily life and to respectfully and thoughtfully interact with the entire environment to which they belonged and which enabled their ways of life to flourish.

(*Note to teachers*) The key here is to be clear that it wasn't just concrete objects and technologies such as stone and wood tools that permitted our species in general to endure as Hunters and Gatherers, or more specifically, that allowed Paleo, Archaic, and Woodland Native American cultures to survive so well in these forestlands. We have a responsibility to remind / inform children about the less obvious emotional, social, intellectual, and symbolic capacities, configurations, and worldviews that have also been crucial for human persistence. For our story of these cultures to be useful and true, these must be acknowledged - even when we're also focusing on amazing aspects of material technology. In other words, let's not slight the human capacities for compassion, cooperation and transgenerational-transmission of wisdom and ethics as we paint pictures for young people about the ways of life of Indigenous Peoples, then and now, and their enduring yet flexible adaptations to diverse and changing environments.

Returning to artifacts for sharing, the conversation could then move on to:

C. Gifts that were Hunted and Gathered from the Forests and Waters (*Artifacts of Material Culture from the Paleo-Indian and Archaic Periods - ways of life that have some correspondences with those of the European Paleolithic*)

Hold up a realistic, well-crafted, large (over 8 inches tall) plastic model of a deer (such as those by Breyer). Ask the children to remember the important relationships that have existed for thousands of years between people and these handsome creatures. Apologize for including a plastic model in the mix of objects (Native Americans of the Contact Period were not dependent on plastics made from fossil fuels!). Explain that this deer model is being shown here to help us all remember how beautiful these living creatures can be. Remind the youngsters that we discussed earlier the many important gifts that deer provided / provide to humans. Ask them to recall that the Native Americans managed the land to make it even more hospitable for deer; also, that they were very careful not to take a deer's life unless there was a very pressing need for food. If you think the message may not have been conveyed on the trail, mention again that even when a deer had been hunted, nothing was wasted and the deer's spirit was acknowledged and honored. Hold aloft a set of real deer antlers, deer scapula bones, tanned deer hides, and a spool of prepared sinews. **How have these various materials from the white-tailed deer been transformed? How can they help humans?** After students weigh in, lift up supple clothing fashioned from deerskin. This might include headbands, mocassins, belts, and / or



Gifts that were Hunted and Gathered from the Forests and Waters

Artifacts of Material Culture from the Paleo-Indian and Archaic Periods - ways of life that have some correspondences with those of the European Paleolithic

pouches. Mention the names of the artists who designed and made these articles. This reinforces children's awareness that Indigenous People are alive and well and continuing to create. Hold up and describe how deer sinews are now commercially dried and rolled onto spools like this. Point out that for thousands of years, deer sinews have been used as string and ties, or, to use another more technical term, "cordage." The sinews serve to join stone tools onto longer wooden handles, including projectile points being attached / hafted onto wooden arrow shafts. Sinews formed the strings for powerful bows. Regarding the deer bones and antlers, indicate how the deer's scapula could be used as a hand tool for digging and weeding, or be attached (for greater leverage) to a long, stout stick to become a kind of hoe. Show the sample antler and note how the tines of the antler could be used for fishing hooks or as tools for pressure flaking chert or flint. Demonstrate quickly if time allows. Antlers could also be made into valuable needles for tailoring leather into fitted garments. The deer skins, sinews, bones, and antlers were all transformed into humanly useful (and often beautiful) products by means of human imagination and cultural skills passed along and often refined from generation to generation.

Materials from other animals besides deer can also be shared at this stage. Some possibilities include large quahog clam shells (used for cups and gardening tools after the meat had been eaten or dried), the soft furs of rabbits or the dense furs of minks, porcupine quills (for the present purpose, stored in a clear, sealed container so the youngsters can view them without being poked), a beaver tooth (historically, a tool for carving), a very realistic life-size plastic model of a brook trout, or one or two handsome striped turkey wing feathers.

During this potentially memorable encounter with these varied objects, I stress that there were no petroleum-based synthetics such as plastic in use when the Indigenous People were stewarding these lands prior to the arrival of the Colonists. There also was no industrially-scaled / machine-dominated mass production in the Americas during these years before Contact (1600). The material objects that made everyday life possible and pleasant for Indigenous People were either gathered directly from 'nature' or handcrafted. As a result, the humanly-made items that surrounded people during their lives were unique creations emblematic of their makers' feelings, skills, priorities, and spirituality. *(Older students)* **Is this the case of the material objects that surround us in our lives today?** Most of the important material objects (from clothes to boats to homes to food) could be viewed as **intentionally crafted works of art** created by and for people who knew and loved each other - people who were also conscious of their participation within (and dependence upon) the enveloping, life-affirming networks of family, community, and cosmos.

To show respect for this history and context, I strongly advise anyone preparing to teach about Indigenous cultures to purchase contemporary, signed works of art from Indigenous artists for this part of the learning. Such artwork could range from tools to baskets to containers to wearables. Such artwork can be obtained directly from Indigenous artists and artists' cooperatives, or Native-owned galleries. The [Vermont Abenaki Artists Association](https://www.facebook.com/MaineIndianBasketmakersAlliance/) and <https://www.facebook.com/MaineIndianBasketmakersAlliance/> are sources you might access. Another option, from the forestlands of the Midwest, is the Ojibwe White Earth Land Recovery Project in Minnesota: <https://nativeharvest.com>. Purchasing such artworks pays homage (in several senses of the word) and adds momentum to movements to keep Indigenous art practices thriving and remunerative for artists creating today. This is one way that present-day educational institutions can support the wisdom keepers of traditional cultural arts. Bringing students into contact with beautiful contemporary Native American artwork also renders our own teaching efforts more inspiring,

authentic, and constructive.

Moving along, the gathering / harvesting / foraging dimension to Indigenous lifeways can be emphasized by showcasing samples of wild plants that were deliberately collected. Highlight nutritious native plants such as hickory and beech nuts, chestnuts, butternuts, walnuts, and acorns, dried or fresh blackberries, raspberries, strawberries, cranberries, raisins or grapes, and maple sugar candies. Let the youngsters look over actual nuts and dried berries stored in two separate woven containers with lids. (A check about nut allergies is necessary – if it wasn't already addressed in school, field trip or camp forms.) I usually have realistic, well-made plastic replicas of grapes on display too because the dried raisins and cranberries don't convey the beauty of the fresh fruits. A few medicinal plants can be highlighted in other baskets as well: for instance, dried plant roots from native ginger / *Asarum canadensis* (used for colds and indigestion) or dried white pine / *Pinus strobus* needles (used in a tea for colds and coughs). Other non-edible but highly useful plant products can be shared. These might include birch bark transformed into containers such as rice winnowing baskets or lidded makuks (designed for holding maple sugar), milkweed and cattail fluff (for insulating moccasins), woven black ash baskets, spruce roots or inner basswood bark (for cordage), woven or twined cattail leaves formed into mats, and sphagnum moss or cattail fluff for lining babies' cradleboards (forming an absorbent sort of diaper). These are just a few of the vast array of provisions that Native residents of this area could rely upon for sustenance and / or supplies for building and crafting. For a much more comprehensive list related to this topic in the Northeastern parts of the present-day United States, see Robinson's Native American Sourcebook, p. 51 <https://files.eric.ed.gov/fulltext/ED406321.pdf> , or access some of the excellent books by Densmore, Russell, Duke, Moerman, or Salmon - or the online Native American Ethnobotany Data Base: <http://naeb.brit.org>

And by the way, as mentioned earlier, I found that small woven sweet grass or reed leaf baskets with lids were excellent containers for carrying and passing around the small items used in this hands-on materials phase of the program. Some of my favorites were purchased from Indigenous craftspeople in Guatemala. I recommend adding (sometimes sewing) jute ties or loops to the containers as needed so that their lids can be fastened in place between programs. This prevents spilling and scattering during transport. Additionally, the lids add an element of surprise and mechanical challenge for the students as they're passing around the materials.

After the explanations, the class can continue sitting and circulating the articles. Encourage those at the far end of the ring to talk with one another about which items or information intrigued them most or to ask questions as they wait for items to be passed.

I usually repeat the suggestion that children think about the person / artist who might have made the artifact that they're examining. I sometimes invite them to hold that memory or image in their mind and heart for a few moments - so that the connection becomes more real.

I also remind them to be especially respectful of the handcrafted materials because each one is unique, a few are ancient, and all are irreplaceable.

Part 2: Examining Gifts from the Gardens and Fields, (*Artifacts of the Material Culture in the Woodlands Period corresponding roughly to parallel technologies from the European Neolithic*). *These were usually carried in a separate basket, and sometimes, the cultivated fruits, small ceramics, and bow and arrow were discussed and shared at the garden. If that was not the case,*

the following procedure is one strategy that can work well.)

After passing around the mostly ‘wild’ gifts of the woodland, mention to the youngsters that the ‘hunted and gathered’ foods would later be augmented (once agriculture had become more common) with beautiful kinds of corn, squash, beans, sunflower seeds, and sunchoke / Jerusalem artichoke roots among other cultivated crops. These plants and some others were important components of Native American farming / agroecology in our region and hence Native American life in general. At this point, hands-on samples of the agricultural harvest could be passed along, including for example collections of particularly stunning bean and squash seed collections, colorful dried corn ears, a corn husk wreath (used in harvest festival games in the Southwest), corn husk dolls, and decorated gourd rattles and cups. A little wooden mortar and pestle (for brief experiments removing and then grinding dry corn kernels) and small fired clay pots are also recommended at this point. This is a good time to remind youngsters that this was the period when the bow and arrow became important in the NE Forests. You might note that the arrowheads were sometimes quite small and that their effectiveness of the arrows was linked to targeting precision (a result of using very straight sticks for shafts (such as the branches of arrowwood viburnum) and, of course, the additional force provided by the archer working with the bow. In some versions of this field trip, the domesticated plant materials, ceramics, and associated tools are shared right next to the garden itself.

Wherever or whenever this information is shared in terms of the field trip sequence, it’s crucial for students to understand that gathered gifts from freely growing plants and animals continued / continue to be vital to the relationships and sacred bonds that existed / exist between Indigenous Peoples and their homelands. In other words, the activities of gathering wild plants and hunting (including fishing) continue to be part of Native American identity and culture. Farming increased the abundance of some options and added some new duties but did not entirely erase people’s appreciation of and need for life-sustaining ‘wild’ biodiversity – biodiversity that often required a modicum of care-taking and support as well. Human’s reciprocal work as protectors, stewards, and kin to the surrounding numinous places and beings (including with our own human families and communities) continues to this very day.

Part 3. Games Option *(See Appendix I, p. 65 - 68)*

Depending upon the size of the group and the availability of teachers and volunteers, you might decide to divide a visiting class so that half of the students can investigate the hands-on materials with less wait-time, while the other half tries an assortment of games. Those game activities might include hubbub, a pin and ring game, the corn darts circle toss, spear-throwing (using spears with corncob tips to target rolled wooden hoops); a ‘backwards’ bag toss; or even (with close supervision) target shooting using a child-safe bow and arrow. For more detailed information about these and other games, please consult Robinson’s Native American Source Book, 1988:151-152, available at <https://files.eric.ed.gov/fulltext/ED406321.pdf>) There is also a short summary of the games that my students enjoyed included in Appendix I to this guide. Of course, if the class is split, each group goes through one set of experiences and then trades places with the other so that everyone eventually encounters both the hands-on materials and the more physically challenging and socially interactive (hopefully fun!) games.

Please note that the games can also be reserved for a culminating activity at the end of the trail.

Usually, they are a highlight of the field trip. Many (especially hubbub, the corn darts circle toss, the pin and ring toss, and the over-the-back bag toss) are easily adapted for an indoor setting or classroom on a rainy day.

When the material sharing and / or games have all been completed - including question and answers and student-to-student conversations and reactions - it's time to resume the walk.)

14. TIPI

Here we have another kind of Native American building. This modern tipi may resemble some of the winter homes or temporary hunting shelters constructed by the Abenakis in the 1500's. However, if that were the case, the building's outer walls would have been panels of birch bark (for a winter home) or reeds mats for a temporary hunting shelter. Reed mats were well suited for temporary shelters because they were very lightweight and could be rolled up quickly and compactly. They could then be carried by canoe or on foot to the next campsite (Russell, 1980:53).

This type of architecture was much more characteristic of the homes built by Indigenous Peoples living in the grasslands / plains west of the Mississippi River. This style of home was called a "tipi" by those people and its outer covering was made from large buffalo skins, which had been previously tanned, sewn together, and often decorated with painted symbols.

Moving to the tipi's interior, I suggest that people sit in a circle, leaving the center of the floor (where the hearth would have been located) open. This is usually a good time to observe the beautiful patterns and spatial effects created by the poles as they move towards the skylight / smoke hole – an immersive, harmonious visual experience that many children and adults appreciate if they're encouraged to notice it.

15. SWEET or BLACK BIRCH (*Betula lenta*)

The Native Americans developed an extraordinarily detailed fund of knowledge regarding the food and medicinal values of various plants growing in these forests. Beginning in childhood, they learned from their elders the specific characteristics and uses of hundreds of plants. For example, a well-enculturated Indigenous person living in the time before Contact would have probably known that this tree, Sweet Birch, has an unusually fresh and pleasant fragrance.

Respectfully examine the tree and find a small twig that can be removed causing minimal damage to the tree's growth. Break off a small end section. Divide this into several pieces and encourage the youngsters to pass it around and sniff. A brief thank-you to the tree for its living twig is also recommended.

The wintergreen fragrance that you notice comes from the chemical methylsalicylate which this tree produces in its inner bark. This is a chemical compound that various plants, including the Black Birch, use for sending messages. It serves as a signal, warning other plants about damaging insect attacks or chomping deer. The chemicals are released from the injured twig and they volatilize (float up into the air). When other plants detect the presence of this compound, they start to produce more defense compounds in their own leaves to ward off potential attackers.

(For older students especially) This communication through chemical signaling is an important

phenomenon that you'll learn more about as you continue your studies of the fascinating lives of plants and their various forest partners - or enemies - including some animals and fungi. It's an example of plants' amazing sensing capacities.

The Native Americans occasionally tapped Black Birch for its sap and used its twigs and bark to make a tea and flavoring (Robinson, 1988:53). They taught the European colonists to do the same. Thus, in the 1800's, this tree became a source of commercial wintergreen flavoring (Berry, M. and MacFarland, J., 1986:6), especially before methyl salicylate began to be synthesized in laboratories. It was also the original flavoring ingredient in the soft drink called birch beer. *Several brands of this sweet, fizzy drink are still being marketed and youngsters usually enjoy sampling this soft drink back at the Nature Center or in their classrooms. Polar Birch Beer™ is often available in New England supermarkets.*

Today, the twigs of Sweet Birch are sometimes called the "Indian's Toothbrush" - although we're not actually certain that the Indigenous Peoples used them as such. We do however have some early documented reports that Native Americans in Virginia used twigs of the Flowering Dogwood (*Cornus florida*) to help with their dental care (Foster and Duke, 1990:270).

16. PARTRIDGE BERRY (*Mitchella repens*)

Can anyone find a very small, creeping, low plant with bright red berries growing along this path? This plant's pretty, paired, and rounded leaves stay green all year round – often under a light blanket of winter snow. This fellow is called Partridge Berry, a reference to the fact that its red berries are often eaten by the New England 'partridge' ('partridge' being the Yankee dialect term for a Ruffed Grouse).

The Ruffed Grouse / Partridge is a beautiful, speckled brown, black, and ivory bird who scuttles across the forest floor like a chicken or quail. Ruffed Grouse roost at night in the forest trees. They are rather well known for the strange, rumbling sounds that the males make with their beating wings. These drumming sounds reverberate at an almost inaudible frequency throughout the woods during the birds' spring courtship displays.

Indigenous Peoples in this part of the world discovered that the partridge berry plant could be collected and boiled to prepare a medicine that could help women during childbirth (Russell, 1986:37) (Foster and Duke, 1990:26).

One way you can recognize a partridge berry plant is to look for its paired, rounded leaves and to note the two yellow dimples that decorate the red fruit. (*Older Students*) Each berry is actually formed from two white blossoms that emerge from the same calyx and then fuse after pollination.

It's important to mention that when traditional Native Americans gathered herbs for medicine, they were careful not to collect an entire patch of a particular plant. Instead, it was customary to spare at least one large, healthy specimen who was sometimes called the 'Grandmother' plant. Similarly, seeds were usually scattered on the disturbed ground from the plants that had been collected (Caduto, 1987). It was also considered best to not to collect the first plant that was discovered - in case this plant was the only one of its species in the area. Robin Kimmerer's description of "The Honorable Harvest" contained in Braiding Sweet Grass, is, as referenced earlier, a magnificent

resource for teaching about the relationships between Indigenous Peoples in North America and the plant-beings who fed, sheltered, and healed them – to recount only a few of plants’ myriad gifts. In writing about these interactions, Dr. Kimmerer explains that experiencing gratitude and reciprocating in some way / giving back are other essential features of the honorable harvest.

17. FALLEN HOLLOW LOG (At Beaver Brook, near the beginning of the Hemlock Trail)

This fallen log is believed to be a favorite shelter for a dog-like, reddish-brown fellow who sports a long bushy tail with a white tip. **Can you guess this animal’s name?** Red Fox. Foxes have been seen along this part of the trail on multiple occasions and sometimes a person can detect their skunk-like scent here. If you were Native American children, you would quickly learn to be alert for all sorts of animal signs. You would learn to use your eyes, ears, and even your nose to gather valuable information. Many mammals, including foxes, beavers, deer, and coyotes, communicate with one another by leaving distinctive scent marks at various sites within their territories.

18. HEMLOCK (*Tsuga canadensis*)

This is a particularly beautiful and long-lived tree. Interestingly, Hemlock is enmeshed in a fine example of interspecies mutualism / reciprocity involving White-tailed Deer, Porcupines, and Elaphomyces (the False Truffle fungi).

Here we have a tree which is very important in our part of the country - the hemlock. (*By the way, if any of the adults on the walk are curious, this is an entirely different plant than the deadly water hemlock that was in Socrates’ cup.*) The hemlock tree’s broad, feather-like branches are densely spaced, flattened, and evergreen. The white stripe on the underside of each leaf / needle is quite decorative. The tree’s branches can catch and hold large quantities of snow during winter storms. They also provide very effective shelter from the wind. Consequently, many animals seek refuge in hemlock groves. Here, you can often find mixed-species winter feeding flocks of birds such as chickadees, titmice, nuthatches, juncos, and downy woodpeckers. Look and listen for these fellows moving about above your head among the dark branches. This is also a space where you can sometimes discover porcupines or deer (Stokes, 1976:206, 306, 326). Because deer (unlike moose) find it very difficult to walk well in deep snow, they will often congregate under hemlocks where the snow is shallow. Thick stands of hemlocks and other evergreen trees such as fir, pine, and spruce often serve as their winter "deer yards" (New Hampshire Cooperative Extension Service, Wildlife Fact Sheet No. 9). In such areas, deer gather and trample down many trails. Both the deer and the porcupines also munch / browse on the hemlocks' young leaves and buds. An Indigenous hunter would know to search for deer in such groves when seeking winter food for his family and village.

These groves are also the place where a complex, interactive partnership occurs between the deer, porcupines, hemlocks, and a small fungus. Here’s the story: When the winter weather is harsh, the porcupines are still able to waddle across the packed snow under the hemlocks. (Remember, not only do the hemlocks hold up a lot of the snow in their branches, but also, the walking deer pack it down even more. The porcupines climb up to the top of the large trees and browse on the tender bark of the youngest hemlock branches. They consume the nutritious bark, and in the process often nip off the outer boughs. The green-leaved tips fall to the forest floor and become welcome nourishment for the hungry deer. Now, the hemlocks, like most forest giants in this region, are only able to grow because they’re being supplied necessary minerals from the rocky soils thanks to usually unseen but essential

help provided by mycorrhizal fungi. Every so often one of these partner fungi (Elaphomyces in this case) produces underground fruiting bodies. Although the spore-producing fruiting bodies can't be seen, porcupines are somehow able to use their sense of smell to detect them. They dig and devour the truffle-like structures. Supper finished, the porcupines ramble off to new places, carrying the fungal spores within their full stomachs. At some point, they leave their droppings in new places, and when this happens, the still viable spores are deposited and begin to grow. New fungal mycelia develop and become available to forge new links with tiny, sprouting hemlock seeds that may have drifted into the area (Rezendes, 1992). In this way, the porcupines inadvertently help the hemlocks who feed them by dispersing the fungal spores (from the fungi who also fed them) who are in turn also helpful partners with the hemlocks! By spreading the Elaphomyces spores, the porcupines enable even more of the magnificent hemlocks to thrive. These can provide more food and shelter in new areas to more visiting creatures, including future generations of deer, fungi, and porcupines. Now how's that for a complicated but encouraging saga?

19. PITCH PINE (*Pinus rigida*)

This tree is well known for its very abundant, sticky sap which is also called "resin" or "pitch." While all cone-bearing trees (conifers) produce rosin or pitch, this tree produces even more than most. Because such pitch burns very well, the Native Americans often used branches from this tree as torches. They also used the sap as a kind of medicine (Russell, 1980:213).

(*Older students*) Rosin, tar, pitch, and turpentine were some of the products early European colonists made from sap extracted from the pitch pines along the Merrimack River (and elsewhere). Some of these were used for ship building and maintenance. Pitch Pines grow in sandy areas, including in the pine barrens that form a distinct ecosystem along the United States' eastern coast. Extracting pine sap for turpentine (often by burning the entire tree) became an industry in some parts of N. America. Sadly, this activity contributed in more recent times to the destruction of vast and ancient long-leaf pine forests in the in both Georgia and the Carolinas. N. Carolina is still known as the home of the Tar heels because of huge quantity of pine sap that was at one time processed there.)

As you walk past this tree, look carefully to see if you can find any resin seeping out from breaks in the pitch pine's bark. If you do touch it, you will probably discover that this resin is extremely sticky!

20. DENNING TREE

Who are some of the animals who might take shelter in this big, standing hollow tree? Owls, chickadees, woodpeckers, bats, opossums, raccoons, skunks, squirrels, and various insects might find this tree a lifesaver during bitter winter storms.

This sort of tree reminds us that even when creatures (such as this tree) die, their bodies can help other sorts of life continue. Many conscientious human foresters today recommend leaving a certain number of standing dead trees within well-managed forests because of the abundant habitat opportunities these dead trees / snags provide – particularly in terms of shelter.

Now if you were a Native American living here 400 years ago, you would want to remember the location of denning trees such as this one. (Denning tree is a name used for any type of dead or hollow tree that can serve as an animal home). You would know that during the winter such hollow

trees can at times be filled with drowsy creatures such as raccoons or skunks, etc. For instance, once as many as 23 racoons were found in a tree like this - although 8 or less would be a more typical number (New Hampshire Cooperative Extension Service, Wildlife Fact Sheet No.4). In any case, if your family ran low on food during a long, harsh winter, knowing the location of denning trees such as this might spell the difference between continued hunger or a welcome feast.

21. BIRD CALLS

Pause along the trail for a few moments to appreciate the sounds of birds. Listen for them calling and singing from the various layers of the forest, or from the tall perennials of the open field. Take a moment to rest and center. Hear them talking to one another in their own unique ways.

Invite the youngsters to quietly focus their hearing by trying the following activity in which each child assembles a 'bouquet' of sounds. Here are the instructions: Begin with your hand closed into a fist and lift it up above your head. Raise a finger every time you hear a new sound. This doesn't necessarily have to be a sound that comes from birds. For example, if you can hear the wind blowing through the pine branches or a low flying airplane, you could collect that sound too. If you close your eyes, you may be able to focus even more intently on your sense of hearing. The activity concludes when most of the youngsters have all five digits extended. They might like to debrief with their classmates about a sound that they particularly liked or that surprised them.

Given that foliage and branches make visual signaling difficult, many forest birds have evolved distinctive, sometimes very melodious, audible signals to communicate with their fellows. Temperate forests in this region are blessed to be the home of a bird whom some consider to be the finest singer in N. America: the Hermit Thrush. *At this point, you might share an internet recording of this bird's beautiful song from your cellphone. Depending upon what the youngsters have heard, you might also play the warning call of a jay or the spring song of the chickadee - who is, of course, a lively, and particularly endearing member of these forests' mixed-species winter foraging flocks. A favorite bird song website or app can serve this purpose well. I like Cornell University's AllaboutBirds.org or Audubon.org.*

You might also mention that Indigenous Peoples used their knowledge and understanding of bird sounds (both calls and songs) and bird behavior in many ways as they went about their daily life. Certain bird sounds - or their absence - were important clues about what was happening in the woodlands.

22. CHESTNUT SAPLING (*Castanea dentata*)

This beautiful young tree is an American Chestnut. Notice the wonderful lance shaped leaves with their distinctly toothed / serrated edges. Each tooth also sports a tiny curved hook. Notice how the overall shape also resembles a spikey candle flame. This is especially true when these leaves turn bright yellow in the fall and their long glowing forms appear to light up the shrub layer. Until about 100 years ago, chestnuts were one of the most common trees in the mature woodlands of this region, as ubiquitous as oaks, hickories, maples, and ash. (The massive hollow denning tree that we passed earlier on the Beaver Brook trail was most likely a chestnut.) Native Americans in this region harvested the nuts from these trees as an important food source. They carved the trees' large straight trunks into strong, long-lasting dugout canoes (Russell, 1980:211).

Today, unfortunately, we almost never find majestic chestnut trees towering in the forest canopy.

Why? - because in 1904 a fungus was accidentally imported into North America from Asia and it began destroying the native chestnut trees. This fungus was able to devastate the trees because they had little immunity to this new pathogen. As a result, most of the adult trees became infected and ill, and gradually died. Interestingly, since the fungus does not invade the root system of the trees, some of the original trees have managed to remain alive underground as roots. This is the case right here. The underground roots of the original chestnut continue - even today - to send up new saplings whose leaves nourish the roots. Sprouts like these are frequently found in the shrub and understory layer. Sadly, most of these young chestnut trees eventually acquire the fungus, and very few mature. Instead, they die back, and then the root systems send up more sprouts. Eventually, with a bit of luck, a resistant strain of American Chestnut will evolve, but until that time, we will no longer see the huge, mature chestnut trees which once were celebrated in this bioregion - both in poetry and at the table.

(Older students in particular) You might be glad to know that people are working to develop hybrids between the American Chestnut tree and the Asian Chestnut tree (which can in fact usually ward off the fungus). There's a cohort of such hybrids being grown at Beaver Brook Association in Hollis. Of course, as suggested earlier, it's also entirely possible that natural mutations among surviving American Chestnuts may, over the long-term, confer blight immunity to this species anyway. Either outcome would be a welcome development - not only to humans, but to turkeys, deer, bear, and many others in the Earth Community whose ancestors used to relish the autumn harvest of chestnuts.

In the interest of full disclosure, we should also mention that efforts are underway to release a genetically modified organism (a genetically engineered) chestnut into the Northeastern Forests, but this is a complex and controversial subject for a different time and setting.

23. SNACK AND STORYTIME

(Suggestions for Guides / Teacher) This is an activity that can take place at any pleasant spot along the trail. Choosing a good time, a good story, and a beautiful place for this pause can be a particularly rewarding and creative dimension to conducting a field trip. Try to select a location and tale that's suitable for the weather, the schedule, and the perceived purposes and characteristics of the group. You can structure this time as an occasion for students to enjoy their food and either visit quietly with friends or listen to the stories. Just designate two areas for these purposes - one for those who'd like to socialize with peers and another for those who'd like to hear the story. Alternately, you could ask the entire group to listen while they're eating, and afterwards, offer time for conversation and exploring the site.

Topics that work well during this resting phase include descriptions of seasonal activities at the time of Contact. Sections from Joseph Bruchac's book The Moon on Turtle's Back, perhaps supplemented with information from the calendars in Robinson's Sourcebook (1986:104-106) or Russell's day-in-the-life narratives, called "The Season's Round" (1980:165-181), convey this information in a very engaging manner. Alternately, you might choose to read or tell a more emotionally compelling lesson story. (If this is a creation story, such as one about Sky Woman, a quick disclaimer and apology might be in order if the story is being told during the growing season. This is recommended because telling this sort of story during this phase of the year is not culturally sanctioned by traditional Indigenous Peoples of this region. This restriction is sometimes attributed to the power of stories to

distract - not only people but other creatures, all of whom have important work to accomplish during this busy time of the year.) With younger children, we have shared the beautiful poem Hiawatha's Childhood by Longfellow as illustrated by Susan Jeffers – although the language is difficult. The musical rhythms and lovely, large visuals seemed to compensate for the forementioned drawback. For older children, Gluscabi stories from Joseph Bruchac's The Wind Eagle have been favorites. Especially timely - and fun – is the wonderful tale about “Gluscabi and the Water Monster” (which highlights the importance of water justice). This story is particularly well received when accompanied by bullfrog vocalizations and a realistic frog replica that can suddenly pop up in the story circle at the key moment of the monster's transformation. Tales from the Keepers series by Caduto and Bruchac are also very appealing and memorable.

Taped stories from Tsonakwa's “Reflections” cassette would also be highly recommended in circumstances where a longer pause is possible. This recording offers many vivid accounts of favorite animals including Porcupine and Coyote, and, as described earlier, it also contains an exceptionally clear explanation of the psychological, social, and even planetary impacts of art-making (potentially applicable to both Indigenous and non-Indigenous makers). In my opinion, this recording should be re-released in a restored digital format! The narrative is both heartfelt and eloquent. It was usually highly appreciated by my students. During week-long summer classes, they would listen to Tsonakwa's stories as they worked on various meditative projects such as beading, basket-making, constructing paper dioramas, or coloring illustrated activity pages.

24. STALKING / LISTENING GAME.

Over the millennia, Indigenous Peoples evolved games which were not only enjoyable but which also helped children develop useful skills for later adult life.

This is one of those games. It's fun, yet it also strengthens youngsters' ability to keep very still, to listen carefully, and to noiselessly stalk prey and / or attend to their surroundings. Here's how it's played: Everyone forms a large circle. One person is chosen to sit in the center with their eyes closed (or they can be blindfolded if they prefer). A small stick or pine cone is placed directly on the ground in front of the student in the center. This child not allowed to touch this stick or pine cone. Instead, they can only hover their hands above it. The object of the game is for another person (who is wordlessly chosen from the circle's edge) to silently approach and try to remove the stick or pine cone without being detected and tapped by the person in the center.

To start the game, the people forming the circle begin walking to the right or left so that the circle is rotating. One individual is selected from the group (by the teacher or a designated student, perhaps one who is not able, for whatever reason, to join the circling crowd). The selected person stealthily moves into the center and tries to take the guarded stick or pinecone. Everyone stops moving and is completely still as this person makes their attempt. Alternately, everyone continues moving - which makes the center person's listening task even more difficult. In either situation, the center person remains in place, and tries to tap the hunting person - if he or she is heard - before that individual can grasp the 'prize.' If the hunter manages to abscond with the stick or pine cone without being tapped, he or she becomes the next listening person in the center. If not, someone new is chosen (perhaps by center child), and the game continues (adapted from Robinson, 1988:49).

25. DELIBERATE, VERY CONSCIOUS WALKING

Here's an activity to use at any point along the trail when surface conditions become steep or challenging in some way:

If a path begins to descend sharply, advise students to pay particular attention to protruding roots, wet, slippery leaves, and demonstrate a 'duck foot' technique for traveling slowly and safely down the steep grade (feet held out at an angle rather than pointing straight ahead). Warn against 'making skis' (feet placed closely parallel) in order to avoid sliding. Emphasize the benefits of allowing plenty of room between individuals - to avoid a domino effect should someone stumble. I also recommend that if anyone thinks they're starting to slip, they should simply (and quickly!) sit down.

Once everyone's on level ground, youngsters might like to experiment with a method of walking that allows them to travel more silently along the trails. I suggest that they slow down and really focus on how they're moving their legs (and body in general) through space. **When taking a step, can they try transferring their weight directly onto the ball of their foot (the very front) and then to their toes, taking care to next lower their heels gently and slowly upon the earth? How can they move their feet in order to disrupt the leaves and / or sticks as little as possible? Feeling the support of the precious ground – standing on this vast planet turning and circling in space - can they consciously breathe in and swing their other foot forward, again intentionally placing the front of their foot on the trail first and then allowing their weight to settle onto their whole foot as they slowly breathe out?** Encourage them to be aware of their connection with the ground that's holding them up and the movement of their breath as they travel along - being very conscious of this act of walking. This is an opportunity for the youngsters to pass through the forest with deeper attention to (and awareness of) their kinesthetic relationship with their surroundings.

26. LOOKING THROUGH THE FORESTS – Big Picture

(Also glaciation and its evidence: prompted by a large glacial erratic and the experience of walking along the ravine near Goulder Brook at Beaver Brook Assoc. This activity / station can be adapted for other locations and other kinds of glacial evidence.)

While walking along the side of this little valley, it is interesting to think how this section of land was once both covered and carved by massive glaciers. These rivers of ice were sometimes almost a mile thick (as we discussed earlier) and they moved back and forth across southern New Hampshire for nearly one hundred thousand years. The advance and retreat of glaciers affected the shape of the land that we see today. It even created whole stretches of territory such as Cape Cod, which was formed when a glacier halted its advance and, as it melted, left behind all sorts of rocky debris. (*Older students*: technically, Cape Cod is an example of a terminal glacial moraine). Glaciers left signs of their passage in the contours of the land, the river valleys, and in the composition of the topsoil, including deposits ranging from sand and gravel to huge rocks - such as this glacial erratic quite close to the trail. **Can you spot the 'out of place' boulder that's called an "erratic"? Can you imagine it being broken away and pushed far from the bedrock where it originated, caught up in the slowly moving mass of a growing glacier? Can you imagine it then, thousands of years later, being left on this ridge as the once towering glacier slowly melted away?**

Besides showing evidence of glacial activity, this area offers a glimpse of the wigwam that you visited earlier. **Do you notice how difficult it is spot the wigwam through all the tree branches? Can you imagine how challenging it would have been to try to hunt with a bow and arrow in these woods in the summer?** Imagine the thick clumps of leaves and brush concealing the prey or

stopping or diverting the arrows. **How would this situation change in winter or would you still have to be concerned about trying to get clear aim free of branches? Considering this, can you understand why Native Americans began training as children to develop their skills at stalking animals, setting traps, and remaining thoroughly still (perhaps on the limb of a massive tree) while waiting for prey to approach within an arrow's range?** Thinking about this may help you to better understand why Indigenous Peoples relied not just on solitary hunting but on trapping, team hunts, fishing, and even farming as means to provide food for their families (Snow, 1980: 77).

27. SHAGBARK HICKORY (*Carya ovata*)

What is unusual about this tree's appearance? - *Many good answers are possible, but hopefully, someone will notice and describe the large plates of peeling, shaggy bark. Allow interested children to gently pat the extraordinary bark.* This glorious tree is a good example of a mature Shagbark Hickory. The word 'hickory' comes directly from the Indigenous word 'pawcohiccora' (Robinson, 1988:98). The English word 'shagbark' refers to the barks' unusual appearance. These trees provided Native Americans with materials for bows, roofs, tool handles, food, and fuel. The nuts were a fine source of food. Here, in eastern N. America, mashed hickory nuts (or walnuts or butternuts) were mixed with boiling water and other ingredients (such as fine corn meal or powdered deer or bear meat) to create a nutritious food especially suitable for babies (Russell, 1980:83, 212).

28. RELATIONSHIPS TO OTHER BEINGS

(Understanding humans as parts of the greater ecosystem / living planet / cosmos: An important insight you might choose to pass along at some point along the trail.)

As you have probably noticed, the Indigenous Peoples who lived here had discovered long ago how to obtain almost everything they needed for their ways of life by interacting with the various entities, living and non-living, whom they found living and existing in this area. For a Native American who had learned the wisdom of his or her ancestors, a walk through these forests was a little like the experience of a person of today going to shop on-line, at a mall, or downtown. As one travelled through a forest or wetland, all around one could discover 'things' that could make everyday life possible and pleasant. Food, medicines, and materials for clothing, shelter, decoration, and transportation were all available in abundance. Significantly, you didn't have to have a credit card or 'money' to get what you needed. Instead, just as loving parents do their best to provide their children with that which they need, the land (or as some of us might say, our sacred Mother Earth and Father Sky) offered everything that was necessary for the people's lives – if the people weren't too greedy or careless!

But of course, a forest was much more to Indigenous Peoples than just a place to shop! The other inhabitants of this complex 'forest' were not just things or objects to buy or take (*Older students: They were not mere commodities.*) And this is a crucial dimension to Indigenous knowing. Instead, they were fellow beings to be respected and esteemed. Moreover, the forest and other features of the First Peoples' homelands possessed a sacred quality, in some ways like a church, synagogue, mosque or temple. They were / are places where the varied life-sustaining powers and spirits are at work and are revealed. Over the years, the Native Americans had learned to interact and relate with other beings and each other in ways which created a kind of harmony within this larger realm of the Sacred. With time-honored cultural instructions and customs, they were able to thrive and flourish here across generations – and importantly, their descendants continue these efforts and this culture

today – and they strive to continue these relationships into the future. (*Older students: And indeed, isn't harmony and sustainability within our biosphere a worthy goal for us all? Isn't that a way of being to which we can all aspire - and towards which we can all work as we live our lives?*)

29. WILD GRAPES (*Vitis aestivalis*)

Among the trees, you can spot some grapevines growing, especially if you look up into the trees' canopies. According to early explorers such as Verrazano, the Native Americans encouraged the growth of grapes by trimming back other plants that might shade them (Russell, 1980:128-129). They collected the grapes both for juice and for eating fresh or dried (Russell, 1980:85).

Some of you may remember that one of the early names for North America was 'Vinland'. The Vikings who visited this continent around the year 1000 (and built at least one well documented – if short lived – settlement) are said to have named this continent in honor of the grapes that they observed growing throughout the Indigenous People's coastal homelands.

30. BURL

The large, round swelling on the trunk of this maple tree (in the woods to the right of the path) is known as a burl. Such abnormal outgrowths can appear on the trunks of various kinds of trees. They may be caused by many things including infections with certain bacteria or fungi. Native Americans were able to fashion such burls into beautiful wooden bowls using only tools such as fire, stone, sand, and a beaver's tooth (Russell, 1980:105).

31. STAGHORN SUMAC (*Rhus typhina*)

This small tree, with large, feather-like, compound leaves is a type of sumac. This species has velvety twigs which you may touch if you like. Some people think that the fuzzy twigs resemble a deer's antlers when those antlers first begin to grow and are still covered with soft 'velvet.' For this reason, the tree is called Staghorn Sumac (stag being the name for a male deer). A lemonade-like drink was (and is) made in the fall by steeping the bright red fruit clusters in very hot water and then straining the resulting infusion. The beverage is said to help alleviate a sore throat (Robinson, 1988:54). Staghorn Sumac's woody, hollow stems were carved into sturdy spiles for channeling maple sap into containers.

32. JEWELWEED (*Impatiens capensis*) and POISON IVY (*Toxicodendron radicans*)

Here's a beautiful annual plant that can grow well in damp, shady places. Its delightful popping seedpods burst when ripe (especially when they're touched) and the seeds are sent flying out in all directions (much to the delight of children who know the plant's tricks). Although people should not eat jewelweed or its seeds (because there's some evidence that both are toxic), this plant has many other fine qualities. From Midsummer to nearly frost, it sports a sprinkling of elegant, dangling orange blossoms. These are speckled with darker spots that attract pollinators. The pollinators include various kinds of bees, hummingbirds, and long-tongued moths, all of whom are rewarded with calories and nourishment as they help the plants make their 'jack in the box' seeds.

Indigenous Peoples across the continent prized a mashed poultice of Jewelweed leaves and its sap-filled stems as a remedy to diminish skin reactions to Poison Ivy. Torn Jewelweed leaves and stems

would be applied directly to areas of skin that had accidentally touched Poison Ivy, as soon as possible after contact. This is useful knowledge to have since both Poison Ivy and Jewelweed are quite common plants here in the Lower Merrimack River Valley and vicinity.

Recent research published by the US National Institute of Health (NIH) has confirmed that Jewelweed poultices of this kind can help reduce skin reactions to poison ivy among humans (although avoiding contact with poison ivy in the first place (!) or a quick washing with soap are even more effective tactics to stave off the troublesome rash). One theory suggests that soapy chemicals known as saponins (which occur in the leaves, sap, and stems of Jewelweed) may be the key to its ability to reduce to some degree the skin inflammation caused by Poison Ivy (Abrams, Motz V, 2012) <https://pubmed.ncbi.nlm.nih.gov/22766473/>.

So that you can avoid brushing into Poison Ivy and releasing its irritating defense chemicals, learn to recognize its characteristic three leaflets with their fairly smooth-edges. (*Point some out to the students.*) Poison Ivy grows in all sorts of places, as a ground cover or as an aggressive aerial vine. When it's climbing high up into trees, you can also identify it by noting its auburn, furry-looking stem (the stem is covered with aerial roots). To some, this stem looks a monkey's tail. You might wonder **why does poison ivy grow in so many places?** Well, over 50 types of birds consume the plant's rather inconspicuous, pearly white berries. These fruits provide the birds with some nutrition but the seeds in the fruit pass right through the birds' digestive systems. Many mammals eat the berries too, and these various mammals and birds disperse the seeds far and wide in their droppings.

Formal Conclusion including a Perspective on Post Contact Developments

As we move out of the forest, let's return from our imaginary journey into the past (and our actual journey through the woods).

At this point, you may find yourselves asking, "**What happened to the people who lived in this area – to the Indigenous Peoples of this bioregion? Where are their descendants today? Is the village near Rocky Pond Hill still there, and if not, why?**"

These are important questions, and the answers are part of a very momentous and often tragic story. We can only offer a brief summary here, and, truly, the events deserve much more study, reflection, and response by us all. Essentially, the lives and cultures of Native Americans in this region were seriously disrupted, distorted, and at times, destroyed as a result of contact with European explorers and settlers, and the colonizing interactions that followed.

In the initial encounters, the early traders and settlers brought some intriguing new technologies to the Indigenous Peoples. These included tools made from metal alloys, the wheel, water-powered millstones, guns, new domesticated plants and animals, distilled alcohol, and written language, to name a few. But perhaps most significantly in those early times, the Europeans brought new DISEASE ORGANISMS. (*For a visual representation of these varied exchanges – to reinforce children's memory and understanding – download the coloring / take-home page at <https://evolvingbeauty.org/native-american-and-european-exchanges/>.)

The arrival of these disease organisms was disastrous for the Indigenous People. They had never encountered such illnesses. While the Europeans had been contending with them for centuries and

had already developed a certain degree of immunity as well as a knowledge of some treatments, this was not the case at all for the Indigenous Peoples. In just forty years, over half of the Native People in this region had died from these newly arrived diseases.

Older Students) Epidemics (a localized versions of a Pandemic) tore through Native communities. Indigenous Peoples sickened and died from these strange illnesses which included measles, bubonic plague, smallpox, and influenza. Native American populations of the Northeastern forestlands were ravaged by these illnesses. This resulted in terrible suffering, trauma, and loss (Salisbury, 1982:101-109,190-192). From an estimated total of 60 to 75 thousand people in present-day New England at the beginning of the 1600's (Russell, 1980:28) or perhaps 100 to 200 thousand (Robinson, 1988:22) or instead 124,700 (Snow, 1980:74), the population plunged to no more than one-half or one-third of those levels by the mid 1600's. **Can you imagine how people felt when one out of every two (or two out of every three) of the people in their family or town died?** In some villages, it was reported that nine out of ten people perished - or even ninety-five out of one hundred (Snow, 1980:35)!

Those who survived faced yet another monumental threat. The population of European colonists was swelling. More and more land-hungry settlers were trudging down the gang planks of transatlantic ships seeking homes or farms for themselves and their families. Some were escaping from upheaval in England and Scotland that had been caused by land enclosures, civil wars, and rebellions. The English colonists continually 'bought' lands from the New England tribes at abysmally low prices, without the full understanding of the individuals 'selling' the land. The English also imposed heavy fines and imprisonments upon Native Americans living near them. In addition, many (but not all) of the colonists regarded the Indigenous Peoples as potentially dangerous **inferiors** (Salisbury, 1982:3-6). They frequently treated them as though they were unworthy of respect or even basic human fairness. New generations of colonists refused to honor treaties and agreements negotiated by earlier generations. The colonists tried to subject and impose upon the Native Americans English laws and customs which were not at all appropriate for the Native Americans' own culture – laws and customs that were definitely not in the Indigenous Peoples' best interests (Haviland and Power, 1981:222-224).

Moreover, the colonists began interacting with the land (including the forests and shoreline) in ways that were very different from (and incompatible with) the Indigenous Peoples' ways of relating. European settlers were staying in one place all year round. Their domesticated cattle, sheep, and pigs were competing with the deer (who were so important for Indigenous People) for food, shelter, and grazing space. Straying cattle were destroying the Indigenous People's unfenced cornfields. The colonists' pigs were spoiling fine clam beds along the coast. (Robinson, 1988:16). The New England colonists were also felling the forests to erect homes, barns, and permanent towns (such as existed in Europe). Such towns began to rise next to favorite beaches where once whole tribes had gathered each summer to harvest their needed supplies of seaside bounty - supplies such as ocean fish, shellfish, and berries. The forests were also being leveled to make room for pastures and hay fields. Even more significantly, the trees were being cut down for export purposes. Lumber from the forests was being sent over to England for constructing wind-powered, tall ships for the expanding Royal Navy. The logs were being turned into smaller boats for commercial fishing and for carrying cargo to an international market. The magnificent trees were also being transformed into barrels for packing salted fish as the settlers began extracting vast quantities of cod and other sea-life from the offshore Atlantic waters. Such barrels were essential too for transporting molasses and rum.

(Older students) The ships and barrels became part of the infamous triangle trade between New England, the Caribbean, and Africa. Part of this trade involved the transport of people who were being captured in Africa and sold as slaves in New England and elsewhere in North America and on the Caribbean Islands. Many of the enslaved people were sent into forced labor camps / plantations on the Caribbean islands. Once there, they were compelled to toil in the hot climate raising and harvesting sugar cane and processing it into molasses. Some of the molasses or sugar cane would then be sent to New England where it was distilled into rum. The rum would then be loaded onto ships bound for Africa where it was sold to buy more enslaved people. This is a terrible story that merits a much longer retelling another time.

When you think about how differently the Indigenous Peoples and the European colonists treated the land and one another, is it any wonder that conflicts multiplied, and that finally, wars erupted over who would live in this region and who would benefit from its wondrous gifts?

Here in Southern New Hampshire, the great Passaconaway, leader of the Pawtucket confederation in the second quarter of the 1600's, urged his people not to fight with the English - whose power and threat he recognized. Some Pawtucket people, following the guidance of the missionary John Eliot, became Christians. This group eventually included Wannalancet (Passaconaway's second son). Many moved to the "Praying Indian" village of Wamesit in present-day Lowell.

During King Phillip's War (1675 – 1676) most of the Native Americans along the lower part of the Merrimack River (including present day Nashua, Tyngsboro, and Lowell), did not participate in the battles against the European colonists. Their neutrality was due to the recommendations of Wannalancet (who had become the leader of the Pawtucket along this part of the river). This was an especially horrible time in the history of this region. The colonists' injustices, persecutions, and land grabs had become too much to bear for many of the Indigenous Peoples. The Narragansetts, the Wampanoag, and several other Indigenous groups formed an alliance in part under the leadership of Massasoit's son, Metacomet (who was also called King Phillip by the colonists). They resolved to try to protect their homelands by force, and to drive out the Europeans. The confrontation ended disastrously for the Native Americans. Many were killed, indentured, sold into slavery, or completely driven out of what is today known as New England.

Despite the demonstrated peacefulness of the Indigenous People of the Lower Merrimack River, they too were targets of hatred towards Native Americans, hatred and fear which only increased during and after the war. Some were confined to camps without sufficient food or land for farming. In other places, they were subjected to intermittent persecution (including vigilante-style killings, imprisonment, hanging, and enslavement in the Caribbean / West Indies). Many of the survivors (including not only Pawtucket people of the Lower Merrimack River but also individuals from the allied Abenaki of the Upper Merrimack River) eventually fled northwest to the village of St. Francis (Odonak) in Canada in 1686 (Nason, 1877:25), (Meador, 1869:235-238).

Yet here in these forests, meadows, and wetlands (that were later to be called Hollis, NH) despite several wars and despite even the horrific scalp-bounties placed upon Native Americans in the first quarter of the 1700's, there were still some 'friendly Indians' to be found. They had a village and

were dwelling peacefully when Peter Powers and his wife Anna Keyes moved into this area in 1731. Powers, Hollis's first English settler, visited their wigwams at the base of Rocky Pond Hill and learned from the Indigenous villagers about the timing of the shad and alewives' run into present day Silver Lake (Nichols and Poole, 1930:27). Powers and his English colonist neighbors exchanged information and even food with the Native Americans of the village. Some of the early Hollis colonists married Native American women. A delicate peace continued in this western portion of Dunstable township for some years.

However, in 1747, events in the ongoing geopolitical battles between England and France (with its many Indigenous allies) were impacting people in this region. Fear of Native American raiders caused English settlers to temporarily flee Peterborough, Lyndeborough, and New Boston, NH. At the local settlers' request, a militia was sent into Hollis. The surrounding forests were patrolled to keep Indigenous People away (Powers and Rudge, 1930). My guess is that only the most assimilated Native Americans could have possibly remained here during this time of suspicion and anxiety.

Significantly, the sawmills in southern New Hampshire - and throughout the state - were deliberate targets of Indian attacks in 1747. The Native Americans knew that if the forests were destroyed, their way of life here could not continue. Consequently, they tried to burn the sawmills (Belnap, 1784).

The Indigenous Peoples and their French allies were defeated by the British colonists in 1748. Fighting continued in the years between 1754 and 1763 - this time with a war zone located much further to the northwest of Hollis and vicinity. By 1747, the Native American village near Rocky Pond Hill stood empty (Tinklepaugh, 1989), and most of the surviving Native Americans who had once lived in this area had been forced to flee north to Canada.

To summarize the situation of the Indigenous Peoples in New England in the years after the Europeans began settlement, we would have to say that first, tens of thousands died of disease - particularly during the epidemics of 1615 - 1619 and 1633 (Snow, 1980:31-42). Thousands more were killed in the wars that resulted from conflicting territorial claims, injustice, and incompatible patterns of land use. Some Native Americans (including Massasoit's nine-year-old grandson, for example) were sold into slavery by the colonists and deported to the West Indies and elsewhere (Russell, 1980:33). Many others were compelled to escape west and north, often to Canada. Yet even still, some Indigenous Peoples remained in the region. In fact, some of you may be the descendants of these Native Americans who intermarried with and adopted the customs of the colonists. Significantly, other Native Americans not only remained on their ancestral lands, but succeeded in maintaining their awareness of their Native American origins and culture across the generations. Some of you may be part of this group. They managed to do this even as they existed within a society shaped heavily by the views and values of the European settlers and their descendants. Today, many contemporary Native Americans are working very hard and proudly to sustain their vital heritage and pass along their ancestral traditions, not only in these lands along the Lower Merrimack River valley, but in regions all across the Americas.

After our walk this morning, we hope that you have learned much more about the ingenious life-ways of Indigenous Peoples in this region, especially during the times before the European colonists' initial arrival. We also hope that you've learned more about this beautiful forested ecosystem that so many of us now call home. Ideally, you realize that the Indigenous Peoples who were living here knew a great deal about existing in harmony within the environment that gave them life. They had

learned how to interact with the other beings of this region in such a way that the land's bounty was not exhausted but could endure and be continually replenished.

Fortunately, some Indigenous Peoples, including many in the Americas and even in this part of the Merrimack River watershed, have been able to keep such cultural wisdom alive and accessible. They have much to teach us all about our roles and responsibilities as children of this beautiful Mother Earth; as citizens within this sacred Earth Community. To learn more about Indigenous cultures directly from the descendants of the First Peoples of the Merrimack River, we especially recommend the websites of the Abenaki Tribe: <https://abenakitribe.org>, the Cowasuck Band of the Pennacook Abenaki People: <https://www.cowasuck.org>, and the Indigenous NH Collaborative Collective: <https://indigenousoh.com/2020/01/31/indigenous-heritage-of-southern-new-hampshire-from-the-past-to-the-present/>. You might also enjoy reviewing the resources included in NH Farm to School's Indigenous Harvest Calendar and Materials project (an initiative which was co-written by the Cowasuck Band of the Pennacook Abenaki People).

To conclude, we hope that you've found this morning's walk useful and thought-provoking! We also hope that you'll keep learning, and that your appreciation for this beautiful land and its many interrelated creatures, past, present, and future - including us people - will continue to grow and bear fruit in good actions. Our thanks and best wishes travel with you!

Endnote 1:

Who was Living around Beaver Brook (Hollis, NH) in the early 1600's?

The exact tribal affiliation of the Native Americans who lived around Beaver Brook in the early Contact Period is not clear. Consulting the map of Contact Period 'tribal' or political subdivisions constructed by Bert Salwen, eminent scholar of this place and period, for Sturtevant's Smithsonian Handbook of North American Indians, we can see that Beaver Brook is situated near the approximate southern border of **Western Abenaki** territory and the junction of **Nipmuck** and **Pawtucket** territories. Let's consider the three possibilities in more detail.

Nashaway was the name given to the Native Americans who inhabited the rich intervalees of today's Nashua River. These people had an important settlement where today we find Lancaster, Massachusetts. The Nashaway are sometimes said to have been part of the larger Nipmuck cultural group which inhabited much of the interior and western portions of present-day Massachusetts and part of Connecticut. The Nipmuck spoke the Loup language and their descendants continue to live in Massachusetts today. It is possible that the Nashaway had villages in the Beaver Brook area in southern New Hampshire (which is indeed crossed by the Nashua River) as well as in Massachusetts in the early 1600's. Unfortunately, there is not a great deal of information about the Nipmuck People from the early 17th century. Some 19th century historians (Nason, 1877:17) even suggest that the Nashaway were part of the Pawtucket group - rather than being Nipmuck.

There is also the possibility that the people living in this area in the early 1600's were Abenaki. The Abenaki continue to be a very active and well-organized tribe. They speak the Abenaki language, which is part of Algonquian family of languages. There are two principal cultural and linguistic subgroups, the Eastern and Western branches. Their population currently numbers over 8,000 people residing principally in Quebec, Vermont, New Hampshire, and Maine (<https://www.britannica.com/topic/Abenaki>. Accessed 19 June 2021). In the early 1600's, their territory stretched from Southeastern Canada, throughout Northern New England from Vermont to coastal Maine. Gordon Day, writing in the 'Western Abenaki' section of the forementioned Smithsonian Handbook (1978:153) mentions that two Western Abenaki groups, the Penacook (based in present day Concord, NH) and the Winnepesaukee, controlled the Upper Merrimack River region. However, in regards to the Lower Merrimack River Valley (which would have included present-day New Hampshire cities such as Manchester and Nashua and Massachusetts cities to the south and west, he points out (1978:152-153) that the Western Abenaki at that time generally resided:

north [emphasis added] of a line running roughly from Portland, Maine, through Manchester, New Hampshire, and Northfield, Massachusetts, to the tops of the Green Mountains, thence northward to Otter Creek, which it followed to Lake Champlain. North of this line were Abenaki-speaking moose hunters with an important agriculture, patrilineal tendencies, and relatively weak chiefs. South of this line were non-Abenaki speaking agriculturalists whose principal game animal was deer, with some matrilineal tendencies, and strong hereditary chiefs.

Considering these geographic boundaries and knowing the preponderance of deer rather than moose in the Beaver Brook area (at least in recent centuries), we have two reasons to suspect that Beaver Brook lands would not have been prime Abenaki territory.

The third group of Native Americans residing in this vicinity in the early 1600's were the Pawtucket. From my reading of Salwen's map (Fig. 1) and the accompanying text in the Handbook (Salwen, 1978:168-170), I tend to think that the Beaver Brook Native Americans could easily have been part of the Pawtucket tribal group or confederacy. Pawtucket territory is thought to have extended from Manchester, NH to the Atlantic Ocean. It stretched from York, ME south to the upper portion of Massachusetts Bay in Salem (Salwen, 1978:169). The Pawtucket were a farming people who spoke a language and possessed a culture that was similar to that of the Massachusett tribe on their southern borders. Unfortunately, the Pawtucket did not survive as a separate, self-conscious Indigenous tribe into modern times. Even their language has been lost. The circumstances surrounding the demise of these people as a distinct cultural unit will be described in subsequent paragraphs.

Even if we incline towards the Pawtucket as the probable inhabitants of the Merrimack Valley in the Beaver Brook area in the early 1600's, the Pawtucket designation requires additional clarification. As mentioned earlier, the Native American living along the Merrimack River in the 1600's are often referred to as "Penacook" rather than "Pawtucket" in numerous histories of this region. For example, the term Penacook was employed by authorities such as Charles Fox, a nineteenth century historian of the Nashua region, and James Mooney, an influential demographer of the early twentieth century. John Swanton also followed this designation in his massive compendium The Indian Tribes of North America, (1952:17), as did more recent scholars Russell (1980:23) and Calloway (1991:3).

Nevertheless, there are good precedents for utilizing - and indeed preferring - the term Pawtucket when referring to the Native Americans of the Nashua / Hollis, NH area in the early 1600's. Even in the 19th century, historians such as S. A. Drake (1867:339) were pointing out that Penacook was the name for one specific community located around present-day Concord, NH and that Pawtucket was the original name used for all the peoples along the Lower Merrimack in the early years of European settlement. In identifying the Lower Merrimack River people as Pawtucket, Drake was following the important tradition established by Daniel Gookin, the Superintendent of Indian relations for Massachusetts Bay Colony, associate of Reverend John Eliot, and one of the most reputable chroniclers of the region's 17th century indigenous populations. Pawtucket was the name Gookin employed in 1674 (1970:10) to describe that nation of Indian people who occupied not only the lower portions of the Merrimack River watershed but also the Atlantic coastal regions from Salem harbor to the Saco in Maine. Bert Salwen, cited earlier, respected the validity of Gookin's original categories enough to utilize the term Pawtucket - rather than Penacook - when he listed and mapped Southern New England's Early Contact Period political subdivisions. Salwen acknowledged that the Pawtucket are often called Penacook, but rejected that term citing Gookin's reference to Penacook as a local group which was part of the Pawtucket alliance. At the same time, Salwen questioned who and where the Penacook people were since the "upriver Penacook at Concord, New Hampshire, were actually Western Abenakis (1976:169)." Later in his entry, he stated unequivocally (1976:175), "Some modern writers, notably Swanton (1953:17-18) have incorrectly extended the name Penacook to embrace both the Pawtucket and the Pennacook and Winnepesaukee of the Upper Merrimack River, who were in reality part of the Western Abenaki group." In a similar vein, in the same compendium, Gordon Day includes the Penacook at Concord, New Hampshire among the Western Abenaki and then observes:

downriver were other bands at Amoskeag (Manchester, New Hampshire), Souhegan, Nashaway, Pawtucket (Lowell, Massachusetts), and Naumkeek (Salem, Massachusetts). It is uncertain whether any of these were Abenaki, and all were

probably under the overlordship of Passaconaway, whose chief residences were at Amoskeag and Pawtucket. Wood's 1634 map shows Penacook [modern day Concord, NH] as a fortified village under the chief Mattacomen, which may indicate that he was coordinate with Passaconaway and independent at this time (1976:149).

Day adds later (1976:150):

John Smith was told that there were 30 habitations on the Merrimack River, but those on the lower river under Passaconaway were probably Massachusett rather than Abenaki in speech and culture.

And here we might repeat that the Pawtucket people were considered to be very close to the Massachusett people in terms of culture and language. The important point in this quote is not the precise terminology that Day is using, but that he is reaffirming the significance of the distinction which existed between the downriver Native Americans of the Merrimack and those of the upriver territories in the years **prior** to substantial European settlement and disruption.

And here we should also clarify that Pawtucket (like Penacook) was an actual Native American town name as well as a 'tribal' designation used by the early European. Pawtucket was a regionally important Native American community located where today we find Lowell, Massachusetts. It was sited east of the very abundant seasonal fishery which existed at present day Pawtucket Falls along the Merrimack River. Early accounts suggest that every year, when the salmon, alewives, and shad were swimming back from the Atlantic to spawn, large numbers of people gathered around the various Falls on the Merrimack and other rivers for fishing, trading, socializing, crafting marriages, and making inter-band decisions (Salisbury, 1982:47). Coburn, a twentieth century chronicler of Lowell's history, quotes Gookin when he attributes a population of 3000 to the town of Pawtucket. Of course, this figure probably applies to the time before the epidemics of the first half of the 1600s and one wonders whether it also represents the temporary population gathered around the town during the annual salmon run. Near Pawtucket, along the banks of the Concord River where that river joins the Merrimack (but still within in the city limits of present-day Lowell), the allied town of Wamesit was located. During the second half of the 1600's, these two towns would fuse to become the 'Praying Indian' town of Wamesit.¹¹

In trying to distinguish between the Penacook and Pawtucket labels, we encounter the blurring of distinctions between the names of villages and the names of 'tribes' as well as the generally confused boundaries of 17th century cultural and / or political units and confederacies. This situation is frustrating, yet understandable too. The historical records from this time are rather meager and usually reflect only the European Colonists' perspectives. Moreover, the alliances among the Indigenous peoples were fluid and evolving (much like those among nations today) - especially as individuals and communities reacted to Post Contact disasters such as devastating diseases and increased warfare. In this instance, the muddled Penacook / Pawtucket nomenclature may result from a true amalgamation that occurred between the two groups in part as a result of the turmoil of the 1600's. This possibility is explored and reflected in Christine Malpica's 2021 Master's thesis for the University of Massachusetts Boston. She refers to the Indigenous peoples of present-day Southern New Hampshire and Northeastern Massachusetts as the Pennacook-Pautucket. Certainly, the Pawtucket people experienced tremendous population losses from the epidemics of 1615-19 and 1633 (Salisbury, 1982:101-106). Additionally, they lost important leaders such as the Sagamore of

present-day Salem, MA to the coastal depredations of Micmac (Tarantine) raiders who were using superior weaponry garnered from the French (Salisbury, 1982:183-184). (Significantly, the Sagamore's wife assumed this role following his death.) From a fighting force of 3000 men in the first third of the century, the Pawtucket as described by Gookin in 1674 had been reduced to a mere 250 men (Salwen, 1978:169)!

Similarly, the Eastern Abenaki along the shoreline of present-day Maine lost many people when the Europeans began settling in N. America. They too had been suffering casualties from raiding Micmac when they and the Western Abenaki were suddenly stricken by the new European diseases. In addition to experiencing common enemies and common catastrophes in the first several decades of the 1600's, the Abenaki of Penacook (around the upper Merrimack and other more northern parts of today's NH and Maine) and the Pawtucket may have become increasingly interdependent upon one another economically as they engaged in a pattern of mutually beneficial exchanges during these same years. According to early observers, such as the Virginia Company's John Pory who visited New England in 1623, the Abenaki were entirely willing to trade furs from their hunting grounds for corn and other food stuffs "in winter especially, when hunger doth most pinch them, which is the season when the French...trade with them" (Salisbury, 1982:144). As the need for European weapons, tools, and trade goods led the Abenaki to specialize in fur trapping during the winter - at the expense of other subsistence endeavors, it is entirely plausible that some of the Abenaki began to rely ever more heavily upon the supplies of corn that the farming Pawtucket could provide. After all, the Pawtucket people enjoyed the advantage of possessing farmland located in plant hardiness zones with longer growing seasons and milder winters than the lands of the Western Abenaki. The Pawtucket people, whose own sources and supply of furs were quickly exhausted once the Europeans arrived, began to function as intermediaries trading Abenaki furs (obtained from the fur rich habitats of the northern Merrimack watershed) with the coastal English Colonists in exchange for European trade goods. This profitable arrangement did not last long but it probably led to increasing ties and trust between the two Native American cultural groups. Salisbury (1982:202) describes the situation and its portentous conclusion as follows:

Beginning in 1633, the colony [Massachusetts Bay Company] not only expressed interest in trading on the Connecticut River and Long Island Sound but initiated activity on the Merrimack. Winthrop understood from his Indian informants that this river, like all the major ones from the St. Lawrence to the Potomac, originated in a single "Great Lake" to the northwest. By ascending the Merrimack, he thought, Massachusetts Bay traders could intercept some of the 10,000 skins that were reaching the Dutch each year. Accordingly, Ipswich was founded in 1633 and, more critically for the future, Concord [MA] in 1635. The latter post facilitated the easy transfer of Merrimack furs to the Charles River, bypassing the longer route out the Merrimack via Ipswich and ensuring Boston's continued economic predominance. Concord also cut out a host of middleman networks in the Bay region including not only English traders like Roger Williams in Salem but the Pawtucket as well. Having been dependent on European trade for two decades, and now deprived of access to their most important ware, the Pawtucket turned increasingly to their own land, the commodity which the English coveted most.

It was at some point during the turbulent first third of the century that a charismatic individual named Passaconaway began to exert a leadership role among the communities along the Merrimack River.

The early European writers offered conflicting views as to the nature and origins of Passaconaway's political authority. Many referred to him as a Penacook and indeed his name means "child of the Bear" - the most important Abenaki totem animal. His principal homes were reported to have been in Amoskeag (Manchester, NH) and Pawtucket (Lowell, MA) according to Day (1978:149) - or in Penacook (Concord, NH) and Pawtucket according to Nason (1877:18) - or simply at Penacook according to Fox (1846:20)! Gordon Day, as previously quoted, rejected the idea that Passaconaway was Western Abenaki and considered the communities under Passaconaway's influence to be Massachusetts in culture and language. Passaconaway signed several significant land transfers before retiring from his leadership position. He delivered a very memorable farewell address at Pawtucket Falls in the 1660's. The ambiguity surrounding Passaconaway's tribal affiliation, his residences, and the extent of his influence may indicate the increased mingling of Abenaki Penacook and downriver Pawtucket and the growing importance of their alliance.

This ongoing blending was further enhanced by the calamitous events of 1669 that further weakened the Pawtucket tribe. The following account is gleaned from Fox's 1846 History of the Old Township of Dunstable (19-21). In 1669, a large group of Penacook (from Concord, NH) abandoned their village to avoid attack from marauding Mohawks. The Penacook travelled south along the Merrimack to join forces with the Pawtucket people living near present-day Lowell. The Pawtucket and the Penacook had both suffered heavy casualties from European diseases but together - this group of Penacook and Pawtucket survivors - proceeded to construct a defensive structure on what became known as Fort Hill in Lowell. Next, the warriors in both groups launched a combined expedition against the Mohawks - who were based along the Mohawk River in present-day New York. The ensuing campaign was a disaster. It cost the lives of some six to seven hundred of the ablest Penacook and Pawtucket men – including fifty chiefs.

Many of the survivors from Penacook (including widows and children) are said to have stayed in the Lowell area with the Pawtucket people. Some became Christians and together with other newly converted Pawtucket people, moved to the Praying Indian¹ village of Wamesit located at the confluence of the Merrimack and Concord Rivers. A short time later, when King Phillip's War broke out in 1675, most of these same individuals, following the counsel of Wannalancet (who had gradually accepted Christianity), dispersed northwards towards Canada as hostility from the English settlers made life in the Merrimack River Valley increasingly untenable. (The massacre by vigilantes of noncombatants trapped in a wigwam in present-day Chelmsford is just one awful example of the cruelty which threatened the Indigenous People.) Many of those who remained or who chose to return to the Massachusetts Bay Colony's jurisdiction were sent to Deer Island during the war - without adequate provisions. This resulted in more deaths. In the aftermath of the war, many Native Americans were imprisoned, sold into indentured servitude in New England, or even executed - if they were thought to have participated in the war itself. Several hundred, at least, were deported to the West Indies for sale as slaves.

As some surviving Pawtucket people sought refuge among the more populous Abenaki to the north, the distinctions between Pawtucket and Abenaki Penacook probably became insignificant. A cultural consolidation occurred. Thus, the Native American warriors returning from the Northlands, from towns such as St. Francis (Odonak, Quebec) and Missiquoi (Swanton, Vermont), to raid the Nashua, NH and Dunstable, MA area during subsequent colonial wars would be called Penacooks by the local historians of the Southern New Hampshire and Northern Massachusetts communities. The last stages of this merging process are clearly described by Gordon Day in the following passage

(1976:149). Although Day doesn't mention the Pawtucket by name, it is not unreasonable to believe that they constituted a portion of that minority of Southern New England Native Americans who settled with the Abenaki in St. Francis:

It appears that many of the inhabitants of the country from the Merrimack River to Lake Champlain, that is the Western Abenakis, found their way eventually to the Saint Francis River. Some Eastern Abenakis from the Chaudiere mission and some southern New England Indians, probably mostly Pocumtucks and Nipmucks, were incorporated into the village at one time. For convenience, therefore, the Saint Francis village [Odonak, Quebec] and all its contributory groups will be considered together here. This means consideration of some peoples who, before their removal, were part of the southern New England culture area and who may have contributed some southern traits to the [Western Abenaki] culture observed at Saint Francis in the nineteenth and twentieth centuries.

In sum, the accounts of many historians from many eras, from Daniel Gookin to Bert Salwen to Christine Malpica, among others, justify the use of the term Pawtucket – rather than only Penacook - to designate the Native Americans living along the lower Merrimack valley during the earliest years of European Contact. This designation allows us to more accurately reflect the original cultural and political subdivisions that prevailed along the Merrimack in the first third of the 1600's. Moreover, by using the term Pawtucket, I think that we presenters can help, in some small way, to keep alive the memory of this once great people whose name disappeared so quickly and tragically from their cherished homelands.

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¹ Praying Indian towns were special communities established under the direction of the renowned missionary Reverend John Eliot for the Christianized Native Americans. The converted Native Americans were settled into these areas and trained in European methods of farming and other trades. They also received further instruction in Puritan Christianity and literacy skills. Before the outbreak of King Phillip's War in 1775, there were 14 of these 'plantations' in Massachusetts Bay Colony. During the war, many of the inhabitants of the Praying Indian towns, including those at Wamesit, were persecuted and forcibly relocated to Deer Island in Massachusetts Bay. There many of the Christianized Indians perished from disease and starvation. Only four Praying Indian communities existed following the upheavals of the war (Simmons, 1986:16).

Appendix:

1. A Few Native American Games

Hoop and Spear Game

Goals: To experience tossing a ‘spear’ and to challenge oneself to do this well enough to stop a rolling hoop. To enjoy learning about an important tool of our hunter and gatherer ancestors, including the Indigenous Peoples of North America.

Procedure: After carefully arranging the playing area for safety, one person rolls the woven wooden hoop while another tosses the wooden spear (with protective corn cob tip) at the moving target (the hoop). If students wish to compete with one another, a suggested scoring method is to allot 3 points for a spear that goes to the very center of the jute net, 2 points for a spear thrown into the next ring of netting, and 1 point for a spear caught in the outer ring.

There are different ways to roll the hoop. Sometimes, we use a bouncing effect and encourage the youngsters to imagine that they are learning how to hunt a rabbit. This game offers a fine opportunity to mention that the cultures of Indigenous People emphasized compassion and kinship with other living beings. The importance of not causing suffering to prey being hunted, even rabbits, was a consideration here. In keeping with such values, Native children played learning games such as this spear tossing exercise. This activity could help future hunters develop excellent aim so that they could send their spears directly into the hunted animals’ vital organs - such as the lungs or heart. This would ensure that the creatures’ deaths were speedy, thus minimizing their pain.

A Backwards Bag Toss

Goal: Learn to coordinate one’s muscles and throw accurately. The intent is to toss a small cloth bag (filled with hickory nut shells, acorn caps, or other bulky materials) so that it lands **beyond** the decorated boundary stick (which is ideally about 5 or 6 feet long). That stick (or length of yarn or jute) is laid on the grass or leaves perpendicular to the trajectory of the toss. For an added challenge, the cloth bag must land within the confines of two imaginary lines extending at right angles from the ends of the boundary stick. (Think of the playing space as an H with the contestant at the base of the H. The flower-and-leaf bedecked stick forms the horizontal element.)

Procedure: The player lies on the ground with his or her head toward the goal. Without being able to see the goal (!), they must toss the bag (or bags) backwards over their shoulders. To receive credit, the bag must land beyond the boundary stick and yet not be too far to the right or left (as described in the first paragraph). Usually, a contestant tosses three times during each turn and there are three bags available to toss. However, one bag will suffice provided someone retrieves it for the player after each attempt.

Notes: This game is usually very popular with students. It develops their ability to direct a

thrown object through awareness of muscular feedback – not vision. It develops muscles on the inner parts of the arm that probably do not receive much deliberate exercise in ordinary daily activities. It also challenges students' ability to aim accurately at an object that's behind them. (It was always surprising to me to see how eager they were to try this task.) The game's level of difficulty can be readily adjusted by moving the boundary stick closer or farther at the conclusion of a round. Perhaps in the past, such an activity benefitted participants' skills with bows & arrows or spears.)

Corn Darts (a game played during harvest festivals in the Southwestern US)

Goal: To toss the corn cob darts into the cornhusk ring in such a way that the darts land within the ring and stay there. This is a game where students learn not only to aim and toss carefully, but also to control / moderate their strength. This is the case since darts tossed too forcefully simply bounce out of the cornhusk ring - and do not count. You can mention that this game reminds us all that it's important not only to have power and good aim, but also to be able to control that power and modulate it.

Procedure: If students wish to compete with one another, the players in a round can each take three tries from a given distance. (Adjust the distance from the ring based on the skill level of the participants.) After everyone has had their turn, who's landed the most corn darts within the circle? Try the process again from a greater distance.

Notes: Students can also structure the game so that they compete in terms of distances thrown. Given three tries, what was the farthest distance they could stand away from the ring and still have the corn dart reach and stay within the target? In this variation, it sometimes works well for students to remain standing on the spot where they launched their longest successful toss. (They might need to mark that place with a leaf or stone - when they step further out for yet another try. They should return to that mark should the subsequent try prove unsuccessful.)

This variation also presents a good occasion for students to work thoughtfully with measurement. What tool or method can youngsters invent (using readily available materials – perhaps even their own foot or a nearby stick) to measure distances from the launching spot to the cornhusk ring? Once they've settled on their measuring unit, they can record the actual distances covered by their successful tosses in whatever units they've created. Depending upon the interests of the students, they might convert their results to standard measurements once they've returned to their classroom.

Students can also play this game as an individual activity. They can work on improving their 'personal best' after initially determining how many corn darts stayed within the ring during a specific number of throws. Alternately, they could discover how far or close they need to stand so that most of their darts reach the target. Then they could try to improve their accuracy from a slightly more distant starting point.

Throughout the game, it's often helpful if the facilitator offers a little coaching and encouragement to the players. If the teacher models this, it can help keep the game's mood

upbeat and playful. The children often accept this as a signal that such a way of participating is fine (or you can even overtly mention this). It's especially positive when the youngsters join in or just take over that role of coaching and supporting one another. Personally, I think the hushed, tense atmosphere of a competitive golf tournament is not what we'd like to replicate!

Hubbub

Goal: Earn the most counting sticks before the game ends. Try your luck and enjoy the company of your friends!

Procedure: Before the game, paint five clean apricot pits / stones black on one side using acrylic paint or perhaps a permanent marker. Leave one side in its natural ochre color. When the apricot stones are dry, place them in a woven wicker dish of the type used for holding paper plates at picnics - or put them in some other pretty, shallow wooden bowl. Also, before playing, collect thirty or forty small twigs to serve as counting sticks (students can quickly do this as part of a walk). Clipped cattail stalks (about an inch or two long) work exceptionally well, but are not essential. These sticks or clipped stalks serve as tally counters and can be kept for future games in a nicely formed woven basket with a lid.

To begin, students sit on the ground in a circle. The first player takes the dish and gently thumps it against the ground so that the apricot stones bounce up and fall back.

The player earns:

2 counting sticks if all five stones land in the plate showing the same color.

1 counting stick if there are two stones of one color and three of another.

0 counting sticks if four of the stones are of one color and the remaining one is different.

As long as a player is collecting sticks, he or she keeps the dish and continues playing. When the four-and-one color combination appears and no sticks are earned, the player relinquishes the basket to the person whose turn is next. This individual takes the dish and begins their turn. The student who has gathered the most tally sticks when the stick supply has been completely distributed (or the game is stopped) is deemed the winner.

Notes: For the earliest English description of the game - with its complete rules, refer to William Wood's 1634 work New England Prospect, ed. by Alden Vaughn, Amherst: University of MA Press, rpt. 1977, p.104. I provided my students with a laminated calligraphy copy of the rules* as Wood described them in Old English, together with a simplified modern version that they could use as a reference. They seemed to enjoy both the game and the historical reference!

The Listening and Stalking Game

Goal: To silently approach and stealthily remove a stick placed next to a seated student whose

Samples of Handmade Hoops and Corncob-Tipped Spears for Hoop and Spear Game

Remember when making the hoops to use freshly harvested (and hence easily bendable) branches for the outer circle.



Backwards Bag Toss
and
Corn Husk Wreath and Corn Darts



Materials, Instructions, and Historical Accounts of the Colonist's Impressions of the Game "Hubbub"



eyes are closed or blindfolded – without being detected and tapped.

Procedure: One child is seated on the ground in the center of a ring of children. That child holds their hands above a small stick or some other object. They close their eyes, or, if they're comfortable with this, wear a blindfold. The other children form a standing circle around the child. The circle rotates around the seated child as quietly as possible. At a signal from the teacher (or another designated student), the circling youngsters halt and one child is selected to leave the circle. That individual moves towards the center youngster as silently as possible and attempts to slide the stick out from under their hovering hands without being heard and tapped. If they are successful, they get to select the next person who'll be in the center. Alternately, the center child who has heard and tapped the hunter has the privilege of selecting the student who will take their place as the seated listener.

Notes: This game can be played on various surfaces with interesting effects. Examples include a leaf-covered lawn or a somewhat open spot along a rocky trail. To seriously increase the listening challenge for the center child, the other students can continue circling even as the stalking youngster begins moving towards the stick.

Principle Sources for Games and Crafts

These are particularly wonderful resources from earlier times. From my experience, I'd venture to say they're worth the effort of seeking them out on-line or purchasing them as used books:

Indian Handcrafts: How to Craft Dozens of Practical Objects Using Traditional Indian Techniques by C. Keith Wilbur. Chester, Connecticut: The Globe Pequot Press, 1990.

Native American Sourcebook by Barbara Robinson. Concord, MA: Concord Museum, 1988.
<https://files.eric.ed.gov/fulltext/ED406321.pdf>

The Wabanakis of Maine and Maritimes: A Resource Book about Penobscot, Passamaquoddy, Maliseet, Micmac, and Abenaki Indians by the Maine Indian Program of the American Friends Service Committee. Bath, Maine: Maine Indian Program, 1989.
<https://eric.ed.gov/?id=ED393621>

2. Crafting Stone Tools with Youngsters Age 9 and Older

Children really seem to enjoy the challenge of crafting stone tools. Creating small versions of specific projectile points, awls, etc. from readily available NH shale was a favorite hands-on activity during the week-long summer programs that I taught. Here's one set of suggestions for conducting such a project.

First, outfit all the youngsters with protective plastic goggles. Students will need to wear these continually for this activity. Fortunately, the goggles are relatively comfortable, inexpensive, and can be reused in subsequent years.

Next, demonstrate clearly how rock shaping can be accomplished. Show the students how to separate flakey chunks of shale (easily found in our region) into relatively thin sheets. Model how to strike the shale with rounded granite cobblestones (hammerstones) and / or other hard, quartz containing rocks. Most shale will split readily into layers. Students are usually intrigued by the idea that shale is a sedimentary rock formed from ancient mud deposits. In contrast, the cobblestones they'll be using are more likely to be igneous rocks that have acquired a rounded shape from years of being scoured by sand and moving water. (It's often fun and intriguing for children to begin thinking about the history of the individual rocks that are all around them. Later, this kind of speculation can blossom into interests in geology and other physical sciences.)

Once the youngsters have seen how the larger shale pieces can be easily shattered into more workable sheets, show them how to select one of the smaller pieces and, through careful tapping or filing, transform its contours. (If a group seems immature with respect to behavior, I do all of the initial separating of the large shale rocks into sheets. In that situation, the students simply refine these flat sheets into the desired tool shape with minor tapping and filing.)

The transformation of such fragments into plausible tools is facilitated by directing the students to carefully study reprinted pages illustrating tool shapes and stone types (reprints of pages 112 - 114 in the second edition, 1996, of K. Keith Wilbur's The New England Indians: An Illustrated Sourcebook of Authentic Details of Everyday Indian Life). As they pore over these fascinating drawings of projective points and stone tools, explain that they should compare the picture outlines to the shale fragments that they have around them. Do any of their rocks already resemble - or at least hint at - the shape of a pictured tool? Duly inspired and guided, the next step is for the youngsters to lightly peck away at the edges of their shale fragments (using a small hammerstone) to amplify the resemblance. Others might prefer to patiently file the shale edges against a harder rock in order to enhance the similarities (a slower but less risky method for shaping replicas). Once a tool is nearly finished, in consultation with a teacher or aide, the student will assess again how closely their creation resembles a particular type of artifact (based again upon a very deliberate examination and discussion of the Wilbur drawings). Any last-minute adjustments to the tool's symmetry and proportions, etc. will be completed.

Lastly, the students write out precise labels for their replica using a special pen (we often used brown or black fine line markers or gel pens) on index cards or trimmed, heavy card stock. The label should include both the name of the stone tool type and the approximate dates that that specific style was popular - information that once more intentionally focuses young people's attention on the lengthy time spans and dynamic qualities of Indigenous culture - indeed, all human culture. The little shale

facsimiles are then glued (with Elmer's white glue or a good quality glue-stick) to their labels. Alternately, they can be wired onto those backings. Small decorations at the corners and / or borders can be added to the cards at this point to make them more beautiful. The finished replicas are eventually displayed as part of a group exhibition that the entire class (and any other nearby classes) can admire. After this, students bring their labeled works home to share with their families.

BIBLIOGRAPHY

- Abrams, Motz V, Bowers CP, Mull Young L, Kinder DH. "The effectiveness of jewelweed, *Impatiens capensis*, the related cultivar *I. balsamina* and the component, lawsone in preventing post poison ivy exposure contact dermatitis." *J Ethnopharmacol.* 2012 Aug 30;143(1):314-8. doi:
- Beals, Jr., Charles Edward. Passaconaway in the White Mountains. Boston: R. Badger, 1916. (on-line resource: <http://www.public.coe.edu/~theller/soj/ttl/sup/passacon-wtmts.html>. Accessed December 26 2020.)
- Belnap, Jeremy. History of New Hampshire, Philadelphia: Robert Aitkin, 1784.
- Berry, M. and MacFarland, J. "The Big Tree Trail: Forest Succession and Wildlife Habitat." Hollis, NH: Beaver Brook Assn., 1986.
- Bourne, Russell. The Red King's Rebellion. New York, Oxford: Oxford University Press, 1990.
- Braun, Esther K. and Braun, David P. The First Peoples of the Northeast. Lincoln, Massachusetts: Lincoln Historical Society, 1994.
- Brooks, Lisa. Our Beloved Kin: Remapping a New History of King Phillips War. New Haven, Yale University Press, 2018. Article from the Website for the book: "Captivity at Coheco" by Allison LaForge and Lauren Tuisula with Lisa Brooks, 2017, <https://www.ourbelovedkin.com/awikhigan/about?path=index>, Accessed March 16, 2022.
- Bruchac, Joseph. The Wind Eagle. Greenfield, NY: Greenfield Review Press 1985.
- Bruchac, Joseph, and London, Jonathan. Thirteen Moons on Turtles Back. New York, NY: Putnam and Grosset Group, Philomel Books, 1992.
- Caduto, Michael and Bruchac, Joseph. Keepers of the Earth Series. Golden, Colorado: Fulcrum Press, 1988.
- Caduto, Michael and Bruchac, Joseph. Native American Gardening. Golden, Colorado: Fulcrum Publishing, 1996.
- Calloway, Colin G. The Abenaki. New York and Philadelphia: Chelsea House Publishers, 1989.
- Calloway, Colin G. Dawnland Encounters. Hanover and London: University Press of New England, 1991.
- Cooperative Extension Service, University of New Hampshire. "Wildlife Fact Sheets No. 4 and 9." Durham, NH: University of New Hampshire.

- Cronon, William. Changes in the Land. New York: Hill and Wang, 1983.
- Day, Gordon. "Western Abenaki." In Handbook of North American Indians: Northeast, vol. 15, William C. Sturtevant, ed., Bruce Trigger, vol. ed., Washington, DC: Smithsonian Institution, 1978.
- Densmore, Frances. How Indians Use Wild Plants. New York: Dover Publications, 1970 (rppt. of 1929 original).
- Drake, Samuel G. The Old Indian Chronicle. Boston: Drake, 1867.
- Fox, Charles J. History of the Old Township of Dunstable. Nashua: Charles T. Gill, 1846.
- Foster, Steven and Duke, James. A Field Guide to Medicinal Plants, Eastern and Central North America. Boston: Houghton Mifflin, 1990.
- Gookin, Daniel. Historical Collections of the Indians in New England (completed in 1674). Massachusetts Historical Society, 1774.
https://digitalcommons.uri.edu/cgi/viewcontent.cgi?article=1013&context=sc_pubs
- Gookin, Daniel. An Historical Account of the Doings and Sufferings of the Christian Indians in New England. New York: Arno Presses, 1972 - a reprint of work written in 1677.
- Haviland, William A. and Power, Margery W. The Original Vermonters. Hanover and London: University Press of New England, 1981.
- Hodgdon, Mary Josephine. Historic Nashua. Nashua, NH: Telegraph Publishing Company, 1902.
- Lottero, Patricia. New Hampshire Indians; A Guide for Instruction. Plymouth, NH: Institute for New Hampshire Studies, 1983.
- Jennings, Jesse D. Prehistory of North America. New York: McGraw-Hill Company, 1968.
- Kimmerer, Robin Wall. Braiding Sweet Grass. Minneapolis, Minnesota: Milkweed Editions, 2013.
- Kimmerer, Robin Wall. *YouTube*, uploaded by the Confluence Project, Nov. 17, 2020,
<https://www.youtube.com/watch?v=ZpLBGK9sYEQ>
- Maine Indian Program of the New England Regional Office of the American Friends Service Committee. The Wabanakis of Maine and Maritimes: A Resource Book about Penobscot, Passamaquoddy, Maliseet, Micmac, and Abenaki Indians. Bath, Maine: Maine Indian Program, 1998.
- Malpica, Kristine. Uncommon Ground: Pawtucket-Pennacook Strategic Land Exchange in Native Spaces and Colonized Places of Essex County and Massachusetts Bay in the Seventeenth

Century. University of Massachusetts, Boston: ProQuest Dissertations Publishing, 2021, 28489906. <https://www.proquest.com/docview/2546556500?pq-origsite=gscholar&fromopenview=true>

Meader, J. W. The Merrimack River: Its Source and Tributaries. Boston: B. B. Russell, 1869.

Moerman, Daniel E. Native American Ethnobotany. Portland, Oregon: Timber Press, 1998.

Moorhead, Warren K. The Merrimack Archaeological Survey. Salem, Massachusetts: Peabody Museum, 1931.

Mourt's Relation. Heath, Dwight B., ed. Cambridge: Applewood Books, 1986 (rpt. of 1622 original).

Nason, Elias. History of the Town of Dunstable. Boston: Alfred Mudge and Son, 1877.

Nairne, James S. and Pandeirada, Josefa N. S., "Adaptive Memory: Nature's Criterion and the Functionalist Agenda." *American Journal of Psychology*: Winter 2010.

Nichols, Rudge and Poole, Caroline. Peter Powers, Pioneer. Hollis, NH: Puritan Press, Inc., 1990 (rpt. of 1930 original).

Pendergast, John. The Bend in the River. Tyngsborough, Massachusetts: Merrimac River Press, 1991.

Rezendes, Paul. Tracking and the Art of Seeing. Charlotte, VT: Camden House Publishing, 1992.

Robinson, Barbara. Native American Sourcebook. Concord, Massachusetts: Concord Museum, 1988.

Russell, Howard. Indian New England Before the Mayflower. Hanover, NH and London, England: University Press of New England, 1980.

Salisbury, Neal. Manitou and Providence. New York and Oxford: Oxford University Press, 1982.

Salmon, Enrique. Iwigara: the Kinship of Plants and People. Portland, Oregon: Timber Press, 2020.

Salwen, Bert. "Indians of Southern New England and Long Island: Early Period. In Handbook of North American Indians: Northeast, Vol. 15, William C. Sturtevant, series ed., Bruce Trigger, vol. ed., Washington, DC: Smithsonian Institution, 1976.

Simmons, Williams. Spirit of the New England Tribes. Hanover and London: University Press of New England, 1986.

Smith, John. Edward Arber. Travels and Works of Captain John Smith, vol 1. Edinburgh: J. Grant, 1910.

Snow, Dean R. The Archaeology of New England. New York, London, Toronto, Sydney, and San Francisco: Academic Press, 1980.

Stokes, Donald W. A Guide to Nature in Winter. Boston, Toronto: Little, Brown, and Company, 1976.

Stokes, William Lee. Essentials of Earth History. Englewood Cliffs, New Jersey: Prentice-Hall, Inc., 1973.

Swanton, John R. The Indian Tribes of North America. Washington and London: Smithsonian Institution Press, 1952.

Tinklepaugh, Joan. The Beaver Brook, Parts II and III. "The Beaver Brook Log." Hollis, NH: Beaver Brook Association, Fall and Winter Editions, 1989 - 90.

Tsonakwa. "Reflections" - a cassette tape of Indian Stories. Minneapolis, Minnesota: Origins Program, 1986.

Wilbur, C. Keith. The New England Indians. Chester, Connecticut: The Globe Pequot Press, 1996, (rpt. of 1978 original).

Wilbur C. Keith. Indian Handcrafts: How to Craft Dozens of Practical Objects Using Traditional Indian Techniques. Chester, Connecticut: The Globe Pequot Press, 1990.

Wilson, James. The Earth Shall Weep: A History of Native America. New York: Atlantic Monthly Press, 1999.

Wood, William. New England's Prospect. Vaughn, Alden T., ed. Amherst: University of Massachusetts Press, 1977 (rpt. of 1634 edition).