

Indigenous Architecture in the Modern World:

How indigenous design philosophies can inform contemporary structures

by

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A Thesis

Submitted in partial fulfillment
of the requirements for the degree
Master of Environmental Studies
The Evergreen State College
June 2015

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The Evergreen State College

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June 3, 2015

ABSTRACT

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Buildings consume nearly forty percent of the energy produced in the United States. When confronted with this reality most architects and builders turn to technological advances in materials and building techniques in order to improve energy efficiency. One potential area for building improvement has received little or no attention. This area is indigenous structural design and building philosophy.

Indigenous peoples of the Pacific Northwest coast are a place-based people who have occupied the region for thousands of years. Prior to European contact indigenous peoples had a distinct design tradition creating longhouse structures perfectly suited to local cultural and environmental needs. The modern day revival of longhouses on the northwest coast leads to interesting observations about indigenous design philosophy and the results of utilizing this design philosophy in contemporary structures. The Evergreen State College is in the process of designing and building an indigenous fine arts campus with the next structure slated to be a fiber arts studio. The fiber arts studio will combine Coast Salish longhouse design with Maori meetinghouse (marae) design creating a unique one of a kind indigenous structure.

The building philosophy of both Maori and Salish people result in uniquely beautiful buildings that coincidentally are energy efficient, place-based structures that blend into, and are part of the environment. This thesis explores the history of indigenous design with a focus on Coast Salish design and asks the question, what would happen if modern architects and builders followed indigenous design philosophy when building modern structures?

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Acknowledgements

I would like to thank my advisor Kathleen Saul for helping turn a random collection of ideas, photos, and words into a cohesive statement, and for having the patience and vision to see the merits and importance of an unorthodox approach. This thesis wouldn't have been possible without your help. Thank You

To Johnpaul Jones for patiently answering my questions and gracefully giving your valuable time to teach me about indigenous design philosophy. I quickly learned I was asking the wrong questions, thank you for setting me on the right path.

To Lyonel Grant, visiting your marae at Unitec was truly a transformational moment in my life. It is an honor to be working on the fiber arts studio with you. Your friendship and council are precious. Thank you for the encouragement and for tolerating thousands of e-mails, and hundreds of photos. Our discussions have altered the way I approach and think about art, culture, and architecture. You are a brother to me and will always be welcome in my home.

To Tina Kuckkahn-Miller, thank you for all your support throughout the years both artistically and academically. Without your leadership and guidance the Indigenous Fine Arts Campus would not exist and this thesis never would have happened. Thank you for allowing me to be part of the Fiber Arts Studio team. I look forward to a continued friendship for years to come.

Finally I would like to thank my family, my wife Lois and our children Kayla, Malena, Araquin and Thayden. Without your support I could never do what I do. Thank you Lois for interpreting academic language into something I can understand and relate to. None of this would be possible without your ideas and insights. You are truly my better half and I feel blessed to spend my life with you. I love you and look forward to spending the rest of our lives together. As always, there is nothing I would rather do than doing nothing with you.

Introduction

Indigenous architectural design evolved over hundreds of thousands of years to suit the needs of indigenous peoples and function in specific environments and climates. As Cajete articulates;

Each traditional structure evolved from the special relationship people had with their environments. Native structures were themselves reflections of the special features and available resources of the landscape of which they were part. The stories, artistic forms, and technologies involved with the construction of these structures were a testament to the long-negotiated relationship with their land and resources.

Unfortunately, indigenous design style and technology is mostly unknown or overlooked in modern building and construction. This thesis will explore philosophy, history, and use of indigenous place-based architectural design with a primary focus on cedar plank longhouses of the Northwest coast. It will also explore the current use of indigenous design in the Northwest as well as contemporary Maori structural design from New Zealand as they relate to the evolution and continuation of historical design traditions.

Methodology

This thesis is exploratory in nature. The primary data for this thesis comes from participatory research such as actively participating in building design, listening to extensive oral histories, and visiting numerous contemporary indigenous buildings around the world.

Other aspects of research for this thesis include interviews and exhaustive museum and archival research, sifting through thousand of historic items, documents, and photos and reviewing as much of the existing literature as possible.

The research question driving the research was, "How can indigenous design, and design philosophies inform contemporary structures?"

Chapter 1

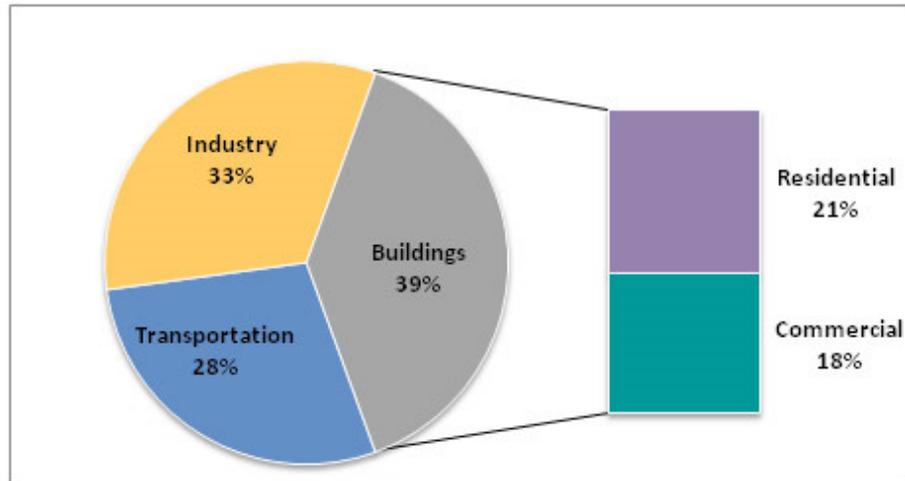
Building energy use in the United States

Accounting for nearly 39% of US energy use, and nearly 38% of carbon dioxide emissions, the building sector has a large impact on energy consumption and greenhouse gas emissions. Even with technological advances and improvements in materials and building design, nearly two thirds of all new construction is not done in a sustainable manner, with only 30% of commercial office space certified as energy efficient by the Environmental Protection Agency's Energy Star certification, and only eleven percent of commercial office space certified as sustainable by LEED.

In the United States, buildings account for: ¹

- 36% of total energy use and 65 percent of electricity consumption
- 30% of greenhouse gas emissions
- 30% of raw materials use
- 30% of waste output (136 million tons annually)
- 12% of potable water consumption

Buildings Share of U.S. Primary Energy Consumption:



Source: U.S. Department of Energy (DOE), 2008

¹ Green Building Council

Existing commercial buildings can receive an Energy Star certification from the US Environmental Protection Agency (EPA) if the source energy use of a specific building equals or is better than the top quarter of all comparable buildings in the area. Unfortunately this means that if all buildings in an area have horrendous energy efficiency, the top quarter of those horrendous buildings can still be certified as Energy Star buildings simply because they are more efficient than comparable horrendous buildings.

In 1993 the nonprofit US Green Building Council was formed. In 2000 the LEED (Leadership in Energy and Environmental Design) green building certification system was unveiled, singling out commercial, institutional and residential projects noteworthy for their stellar environmental and health performance in both the United States and abroad.

Leadership in Environmental and Energy Design (LEED) green building rating system is designed to encourage the adoption of sustainable green building practices. Buildings earn points credit upon a number of factors including energy efficiency and aesthetic factors.

These aesthetic aspects have broader social implications, rather than just rating a building on energy efficiency, or use of sustainable materials. The aesthetic aspects include quality of living for the occupants; things like whether the building is within easy walking distance of public transit, or whether the indoor environmental quality includes things like access to daylight, views, or better indoor air quality than other buildings. In essence, LEED seeks to go beyond simple technological and energy saving fixes and look at the total environmental impact of a structure including water efficiency and impacts on local ecosystems (Council, 2015).

If Energy Star and LEED certified buildings save money on energy costs and are more pleasing to the occupants why aren't more buildings designed to meet these standards? Many barriers exist to implementation of sustainable building practices. Although they save money over the life of the building many

LEED certified buildings incur an upfront costs proving prohibitive to many builders

Market barriers also exist. One such barrier known as the “split incentive” barrier, describes a disconnection between those who manage the building, and those who must pay the utility bills. Split incentive is when tenants do not have direct control over building improvements, and landlords will not reap benefits of being more energy efficient, therefore they have no incentive to retrofit, nor build in a sustainable fashion.

Initial cost vs. life-cycle cost: Sustainable building design has many more upfront costs associated with it. Sustainable building materials often cost more. Soft cost which include; labor and design are much higher in sustainable building because of the expertise required. The energy efficiency of these buildings means that operating costs, such as heating and cooling over the lifetime (life-cycle) of the building are far lower than standard buildings. In many cases it can takes years for energy savings to equal the upfront costs of building a sustainable building.

The design and installation of many technological advances such as solar, geothermal, advanced heating and insulation all require specialized expertise to install. This expertise costs more than the standard run of the mill general contractor. In most public buildings, contracts generally are awarded to those who limit construction costs. This practice tends to hinder energy efficiency because initial capital costs for the installation of superior, more efficient building technologies exceed those of standard inefficient buildings; the same technologies that reduce subsequent operating costs.

Public policy is inconsistent when it comes to sustainable building. Most building codes are local, meaning they are implemented at city, county, and state levels. Sometimes public policy can be in direct conflict, where one policy encourages more energy efficient buildings, while another pro-utility policy encourages more energy use, usually to support in an effort to support local utilities or energy producers (Kok, McGraw, & Quigley, 2011).

Information barrier: A general lack of information about energy saving technologies, opportunities, or incentives can result in people simply not

knowing that energy efficient options exist. In some areas of the country there may be interest in sustainable buildings, and sustainable building technologies but no local expertise or access. Local building suppliers may not stock energy efficient technology. Additionally there may not be anyone local who has the expertise or knowledge to properly install sustainable technologies (Kok, McGraw, & Quigley, 2011).

The barriers that prevent more energy efficient buildings enumerated above also deter implementation of indigenous design.

Chapter 2

Indigenous design:

Around the world indigenous peoples create structures that reflect their history and cultural values. These structures are place-based, meaning they would not make sense if located in any other location. Place-based also means indigenous peoples take local ecosystems, topography, weather patterns, and cultural norms into account. Many historic indigenous dwellings such as the famous tipi of the great plains, and the hogans of the Navajo nation have their doors facing east, to welcome the morning sun. This simple alignment reflects a strong cultural imperative. In the Pacific Northwest longhouses faced the water. Many of the pueblos of the southwest are build upon historic foundations hundred and perhaps thousands of years old, such as the adobe houses at Acuma pueblo which has been continuously inhabited for over 1,500 years.



Acuma Pueblo, P. Boome 2010

Generally indigenous design uses locally sourced materials and aspires to adhere to, or build upon, a historic design tradition reflecting the cultural values of the people the building serves. These historic design traditions such as facing

the door east, or using specific building materials such as red cedar in the Pacific Northwest, or adobe in the southwest reflect a connection to historic design and cultural identity. Using cedar in the southwest or adobe in the northwest wouldn't make sense on a variety of levels. The indigenous peoples would have no connection to these materials or expertise in their use. The materials likely wouldn't work or be ideal in different climates. Adobe wouldn't stand up in the relentless northwest rain, and cedar would split and crack in the dry southwest climate.

Indigenous design is also a philosophical approach to building design. It expresses a relationship with the natural world. Indigenous peoples developed technologies as ways to deal with issues that come up in the process of living in a particular place, such as a coastline, mountain, desert, etc. (Cajete, 2000). In this way traditional architecture is an example of this applied science. Each structure evolved from the special relationship people had evolved with their specific environments. In addition indigenous structures were themselves a reflection of the features and resources of the landscape. Their stories and artistic forms reflect a continuation of an environmental relationship. The adobe structures with their historic wooden ladders of Acuma Pueblo pictured earlier illustrate this connection.

Adobe is perfectly suited for the climate of the southwest. It maintains a consistent temperature remaining relatively cool in the summer and warm in the winter. Adobe is abundant, easily replaced and repaired. The wooden ladders are similar in design to those found at ancient Anasazi ruins suggesting a continuation of this historic design tradition.

The Longhouse

The “*House of Welcome*” Longhouse Education and Cultural Center is a public service center at The Evergreen State College. Opened in 1995 and fashioned after historic northern longhouses of the northwest coast, the longhouse was built in collaboration with area tribes. The Quinault Indian Nation, for example provided timber for the support beams and structure of the Longhouse (Capoeman-Baller, 2014).

Designed by Johnpaul Jones, the Longhouse was the first building of its kind on a public campus in the United States. The Longhouse serves as multi-purpose facility providing a wide variety of educational, cultural, and community functions. The Longhouse provides a gathering place for indigenous peoples and the Evergreen community and can be seen as the pride and joy of the school. Hosting thousands of visitors every year, the Longhouse is a primary attraction on the Evergreen campus; no visit is complete without a tour of the structure.



[House of Welcome, Longhouse at the Evergreen State College, L. Grabhorn 2015](#)

The Longhouse provides and promotes indigenous arts and cultures through a wide variety of programs. The Longhouse regularly offers workshops and visiting artist residencies as well as an annual holiday art market providing local indigenous artists an opportunity to display and sell their work.

In an effort to expand these functions the Longhouse staff is working to build an indigenous fine arts campus to facilitate a planned Masters of Fine Arts program with an emphasis on indigenous arts. This program will be the first of its kind in the northwest. The indigenous MFA will focus primarily on visual arts including painting, printmaking, weaving, carving, and glasswork. While these works will be cultural in nature they will include both contemporary and traditional art styles.

The Indigenous Fine Arts Campus will provide a series of art specific spaces for indigenous artists and peoples, with a particular emphasis on local Salish peoples of the Pacific Northwest. The campus will further the college's mission of education while connecting indigenous peoples locally, regionally, nationally, and internationally with an international focus on indigenous peoples from the Pacific rim. The fine arts campus will allow artists to work in styles and materials which may not be readily accessible to them otherwise. Students in the fine arts program will be mentored by master indigenous artists from around the world while having the opportunity to participate in indigenous cultural exchanges.

Educationally, culturally, and artistically, the fine arts campus will have far reaching impacts for artists, tribes, and communities. Participants will learn to preserve and, in some cases, re-establish important cultural art forms while also passing that knowledge on to others. Artists will be able to create marketable works and learn business skills so they will be able to sell these works at local, regional, national, and international markets, thus enhancing their economic opportunities as well as educating the broader public through engagement about contemporary indigenous arts and cultures (Kuckkahn-Miller, 2014).

Opened in 2012 the carving studio named, *Pay3q'ali*, means "a place to carve" in southern Salish. The carving studio is the first step in the creation of the indigenous fine arts campus. The studio was created using a historic Salish shed-roof design. Salish shed-roof longhouses, also known as single-pitch plankhouses is unique in that there isn't a gable, or ridge on the roof. This design

allows for the easy removal of roof and wall planks. This is important because Salish longhouses were primarily multi-family winter dwellings, with the roof and wall planks taken apart and used for temporary summer dwellings.



Carving Studio at Evergreen State College, P. Boome 2015

The next phase in the creation of the indigenous fine arts campus will be the construction of a fiber arts (weaving) studio, currently in the final planning and pre-construction phase. It is my connection with this fiber arts studio that has led me to this thesis. The fiber arts studio is being collaboratively designed by master Maori carver Dr. Lyonel Grant, and internationally renowned Choctaw architect Johnpaul Jones. I am the Coast Salish advisor on the project and will

work with Grant and Jones to integrate Salish design, and carve structural and decorative elements of the building.

The college and Longhouse staff selected Jones and Grant for this project because they are among the best in the world at what they do. Johnpaul Jones is a world renowned architect who served as the lead architect for the National Museum of the American Indian (NMAI), one of the Smithsonian museums built on the National Mall in Washington D.C. Because of Jones' building philosophy, his buildings tend to be more sustainable and energy efficient than other buildings. As Jones puts it when describing the energy efficiency of the National Museum of the American Indian;

We didn't set out to be LEED certified or anything like that when we built the museum. Just by following the philosophy and belief system that was important to us, we ended up with a LEED certified building, one of the most energy efficient buildings in DC.



National Museum of the American Indian Washington DC, P. Boome 2014

The design of the NMAI is meant to communicate important cultural and physical ideas about indigenous peoples of the Americas. There are four stones gathered from the far north, the far south, far east, and far west of the Americas. The curves and lines of NMAI are meant to mimic the shapes of the windblown sandstone canyons of the southwest. Rainwater is gathered, creating a pool and watering important indigenous plants in the gardens outside the building. The position and cycles of the sun were taken into account. There are prisms located in the roof of the main atrium. During the summer and winter solstices these prisms shine light on the rotunda floor creating a rainbow effect symbolizing transition and growth.

Jones has received countless recognitions and awards for his architectural designs including the 2014 National Humanities Metal, awarded by President Obama. Jones was also the architect of the original Longhouse at Evergreen. His firm Jones and Jones is internationally known for building and landscape architecture which focuses on the power of place. According to Jones:

Cultures spring from our relationship with the land. The adaptations people make in their places build living traditions, which are continually evolving and contribute to a regional and local sense of place. Celebrating these traditions—these human connections to place—is a cultural imperative which is often overlooked by conventional planning and design. Great design comes out of listening and asking questions. It's a means for telling powerful stories in physical form (Jones J. , 2014).

Lyonel Grant is a Maori carver and designer who has worked on several carved Maori meeting houses, also known as whare, and marae. These meeting houses are generally multi-function buildings serving the needs of specific communities. Carved meeting houses not only provide a location for special events such as wedding or funerals, they also communicate a story of the people of the area. The carvings often represent ancestors or ancestral stories of the area. The marae's often tell an important story about the tribal history of the people the marae serves.

Affectionately called Lyonel's house by many Maori, Te Noho Kotahitanga lies at the heart of Unitec's Mt Albert campus in Auckland. Grant's remarkable work on Te Noho Kotahitanga, the marae of Unitec Institute of Technology in Auckland New Zealand has won him international acclaim. Much like the longhouse at Evergreen, Te Noho Kotahitanga is the first whakairo (carved meeting house) carved in the traditional fashion in nearly a century. Most meetinghouses that have been constructed in the last century have been western style buildings. If they are carved they have simply been a carved façade placed on a western building, the carvings serving no structural function and being simply decorative in nature. Te Noho Kotahitanga's carved elements are structural as well as decorative in nature the support beams, rafters, and other building elements are all carved, integral parts of the building.

Lyonel's house is the centerpiece of Unitec. Serving as a multi-purpose facility. Te Noho Kotahitanga is in constant demand for use as a classroom, meeting and gathering space. The design philosophy behind the marae resulted in building being energy efficient and sustainable much more so than similar sized structures in the area. The philosophical approach to the marae is one of integration into the environment rather than a standalone building simply being placed on a plot. Historically Maori carvers would save the chips and other pieces of wood that weren't going to be used. After a carving was completed the carvers would return the unused portions of wood to the forest where it had come from. When working on Te Noho Kotahitanga, wood chips and sawdust were saved. Eventually several large dump truck loads of wood material was returned to the forest where the lumber had been harvested.



Te Noho Katahitanga, Unitec Institute of Technology, Auckland New Zealand , P. Boome 2014

Notice in the picture above the exquisite carvings on either side. The Central pole is a bronze cast from a wooden carving. The siding is compiled of thousands of pieces of wood that normally would have been thrown away as waste material but instead were pieced together to form a beautiful mosaic. The figure on the top of the pole is actually formed in negative space. If you look carefully you will see two heads coming together in a traditional Maori greeting.



Te Noho Kotahitanga, interior view, P. Boome 2014

Te Noho Kotahitanga, has received international acclaim for being on the cutting edge of design. By building one of the first traditionally carved buildings in nearly a century, with a traditional design philosophy, this traditional design philosophy dictates that many of the structural elements of the marae are also artistic elements, and that the artistry tells the story of the marae. Grant utilized modern technology and materials to *enhance* rather than replace traditional indigenous knowledge. Grant's approach much like Jone's relies on the belief that structures be place-based. Rather than simply placing a building on a cleared lot, indigenous philosophy encourages builders to fit into the natural landscape and surroundings. Both Grant and Jones incorporate important aspects of the land such as topography, orientation of the sun, indigenous plants,

water, and the customary relationships people have with their environment. As Grant states,

We have a tradition here in Aotearoa, that relates to the formally seeking permission of Tane Mahuta the forest entity to take one of his children for the purposes of creating a craft that will better the lot of humans. Permission is also sought of the birds and other creatures the reside in that tree (Grant, Maori Master Carver, 2015).

Grant articulates a commonly shared indigenous attitude and belief system that is one of the driving forces behind the Evergreen Fiber Arts Studio. Another driving force behind the design of the Studio is the idea of improving upon the existing approach. The Longhouse was the first of its kind requiring remarkable vision and planning. The question is: How do you improve upon the longhouse foundation and create a truly remarkable structure that incorporates the best of traditional design, contemporary technology, and embodies the spirit of those who designed the building, those who will utilize the building, as well as the spirit of the land and people on which the building sits?

In order to complete this task and build upon a historic design tradition we must first understand the design tradition we build upon. Along with understanding this tradition we must also understand the complexities of energy efficiency and green building technologies. The combination of traditional building design, coupled with technological advances in materials and energy efficiency will lead to a truly remarkable and inspired structure, one that has the potential to be emulated around the world and serve as an example of the ingenuity and intelligence of indigenous design and indigenous design philosophy.

Chapter 3

Historical Indigenous Structures on the Northwest Coast

Indigenous peoples used a wide variety of historical structures on the northwest coast. These adaptable structures varied as much as the people who created and used them. Most groups in the northwest used seasonal dwellings. Large communal dwellings housed numerous families in the winter that served as gathering places for important social and cultural activities such as a potlatch. People lived in small, portable summer homes that could quickly and easily be moved as necessitated by fishing, hunting, and seasonal gathering. Some seasonal structures were more permanent in nature, frames would be left behind, or complete dwellings might be occupied for only portions of the year. One such permanent dwelling that was occupied seasonally was the pithouse.

Pithouses

While fairly common among the tribes of the American southwest as well as plateau tribes of the northwest, pit houses are less studied or known along the coast. Despite the presence of numerous housepits (superficial remains of pithouses) there is a gap in our knowledge of these structures. Ethnographers working among the Coast Salish communities where both plankhouses and pit houses were used tended towards a reductive approach in their descriptions of the latter. Whereas plankhouse design and construction were described in rich detail a sparse definition of a circular, semi-subterranean winter home was provided for pit houses with little additional elaboration likely because there are no known surviving examples (Springer, 2009).

Salish peoples dug pit houses into the ground providing them with insulation as well as protection during times of war. Pit houses came in many shapes from smaller circular pit houses to larger longhouses, only partially dug into the ground. The larger longhouses also known as plank houses were

commonly used from northern California up through the Oregon coast. The smaller circular pit houses typically were found in northern Washington and into British Columbia. These pit houses located inland from the Salish Sea, mostly along rivers, like the Fraser, and in higher elevations towards the mountains where the weather is colder. Most Salish pit houses were small often with single-family occupants, although they were commonly larger frequently housing several families in a single pithouse.



Pithouse replica, Royal British Columbia Museum, Photo Mike Waterman 2014



Coquille Plankhouse Coos Bay Oregon, P. Boome 2014

The Coquille Plankhouse in Coos Bay is a modern version of a historic plankhouse. The plankhouse is about half subterranean dug into the ground at nearly the depth as the visible exterior walls. Much like the longhouses of Alaska the low doorway served two main functions; one was the retention interior heat the second function was that of protection. The low doorway forced visitors to bend down in order to enter, this defensive strategy of forcing an attacker to bend down while entering gave the occupant the upper hand in close-quarter fighting.

Summer / Temporary Dwellings

Summer houses were generally small single family dwellings used primarily during hunting, fishing, or gathering seasons, moved frequently to accommodate these activities. Often made of woven mats and other light materials summer homes used cedar planks and wooden poles as support structures. Somewhat like a modern tent, the poles and support structures were generally gathered from the local surrounding and lashed together. The type of wood used depended on what was available locally; alder, maple, and other types of saplings could be used interchangeably. Cedar planks from winter

homes were often used as main structural components such as main beams and wall support. All that was required was a simple frame that woven mats could be hung from. While the houses themselves were temporary, families tended to return to the same locations year after year.

Note that the cedar planks were used year round were the inspiration for the term “plank house” which is often used to describe larger, multi-family winter dwellings.

Abundantly available in the northwest cedar has many desirable traits including the ease with which it can be split into long planks by driving wedges into the ends of cedar logs. Not only used for dwellings, cedar is the wood of choice for dugout canoes, carvings, bent-wood boxes, many tools, baskets, and even clothing.

Heavily used canoes wear out. When this occurred their sides were cut off and used as cedar planks for longhouses, showing remarkable recycling and ingenuity (Mauger, 1978). This type of exceptional connection with the locally available material demonstrates the indigenous philosophy of creating as little waste as possible.

Summer houses were exceptionally important to the indigenous peoples of the northwest coast as is evident by their inclusion in numerous northwest treaties, such as this passage from the Point Elliott treaty of 1855.

The right of taking fish at usual and accustomed grounds and stations is further secured to said Indians in common with all citizens of the Territory, and of erecting temporary houses for the purpose of curing, together with the privilege of hunting and gathering roots and berries on open and unclaimed lands.

Indigenous people generally did not understand treaty language nor the concepts surrounding European private ownership, the fact that they insisted upon the ability to erect temporary houses shows the absolute importance of doing so.



[Snohomish temporary dwelling, Puget Sound 1905, University of Washington digital library.](#)

Notice in the previous photo the woven mat and drying salmon. The salmon appear to be chum or “dog” salmon, the least favored salmon species in the northwest. The pole in front as well as the cross-beam are made from alder as evident by the bark.



Tulalip Summer Home (women known only as Annie and Katie), 1904, University of Washington Digital Archives.

The photo above of the Tulalip summer home demonstrates the use of mats, and cedar planks. You can discern the frame of the structure, it is a smaller version of a larger gable roof dwelling.



Lummi woman weaving in front of mat house. 1912 Coast Salish; National Museum of the American Indian

Notice on the photo above the skillfully woven mats lining the walls were multi-functional, serving as walls, dividers, and floor, or sleeping mats. They were likely woven from tule, reeds or other local grasses. They were utilitarian in purpose and generally unadorned.



Esquimalt dwelling. Temporary shelter covered with woven mats for long-distance travel. Planks shown in foreground. Vancouver Island 1880. National Museum of the American Indian.

The previous photo shows cedar planks in the foreground and stacked along side the dwelling. These planks are likely the same planks used as walls and roof sections of larger multi-family plankhouses during winter months.



Skokomish Fishing Shelter 1913, Library of Congress

This Skokomish shelter shows the simple tent-like structure commonly used for summer shelters. The elaborately woven and colorful baskets are a sharp contrast to the unadorned reed mats used on the structure. The canoe is a small river canoe probably around 12 to 14 feet in length, perfectly designed for small families and for navigating along rivers.

Cedar Plankhouses

The most famous and studied of all northwest indigenous structures plankhouses vary in design and size from region to region, and are known by a number of interchangeable names. Names such as, plankhouse, long house, big

house, meetinghouse, potlatch house, and smoke house all refer to large cedar plank dwellings.

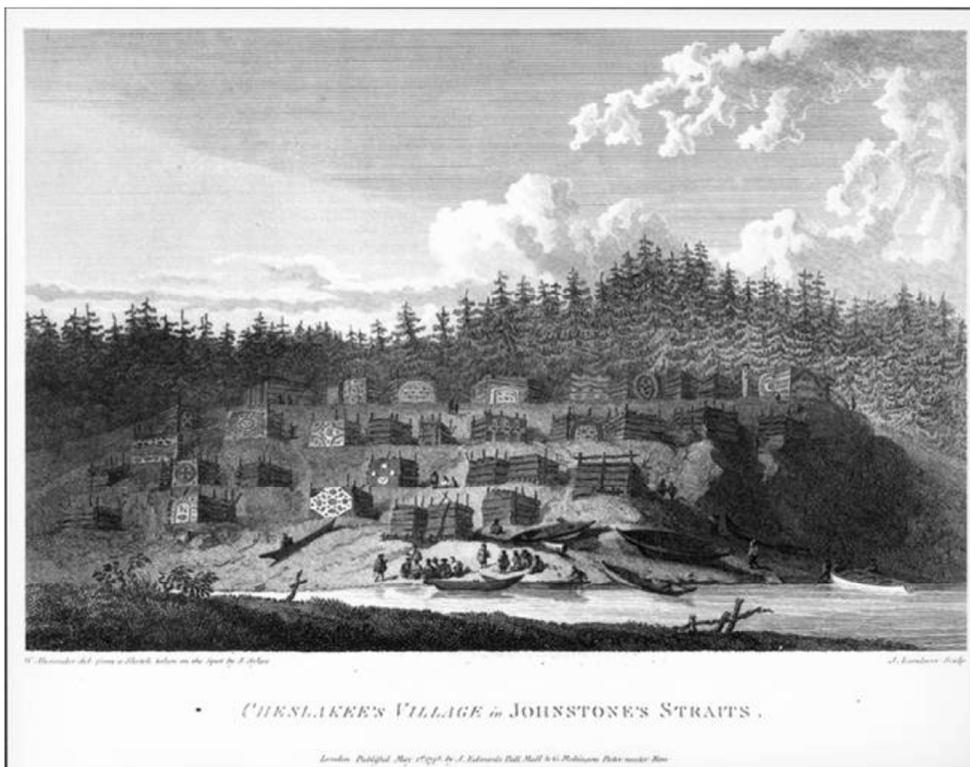
Plankhouses were commonly used as winter dwelling housing several families and serving as important cultural gathering places. Considered almost as living entities, most houses were given proper names, acquiring reputations for their status among the people.

In 1778 James Cook brought his ship *Resolution* into Nootka Sound on Vancouver Island's western shore. After he dropped anchor Cook climbed a notched-log stairway from the beach to examine some of the most sophisticated wood architecture in the world. Standing imposingly above the tide line three rows of large cedar-plank houses lined the "main street". Cook observed "

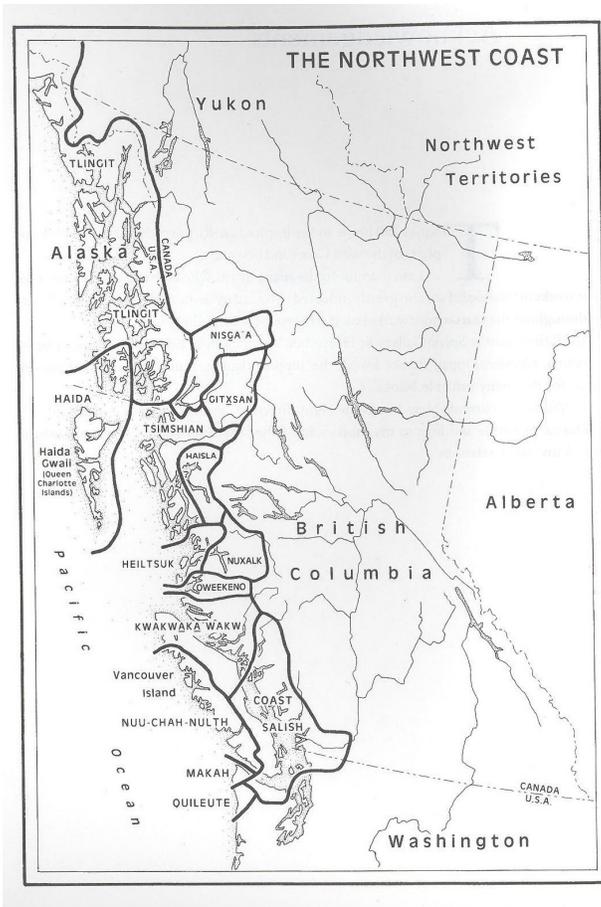
The height of the sides and ends of these habitations is seven and eight feet; the back is higher than the front, by which means the planks that compose the roof slant forward; they are laid on loose, and are moved to let out smoke and admit air or light."

Cook also noted carvings on the inside of the houses,

These are nothing more than the trunks of very large trees four or five feet high, set up singly or by pairs, at the upper end of the apartment, with the front carved into a human face, the arms and hand cut out upon the sides, and variously painted, so that the whole is a truly monstrous figure... (Nabokov & Easton, 1989).



Kwakiutl village on a hillside, Vancouver Island, Johnstone Straight, British Columbia, engraving 1792, University of Washington digital collections.



Map, (Carlson, 1976)

In order to better understand and study plankhouse (and artistic) variation scholars have grouped the dozen or more major Northwest Coast tribal groups (usually linguistic groups) by three sub-regions: Southern, Central, and Northern.

All of these groups constructed wood plankhouses, using massive logs for their post-and-beam frames, long split and adzed planks for their walls and roofs. Most groups used and preferred western red cedar. Indigenous groups in northern California used giant sequoia, while their northern cousins used the less common white cedar, a remnant of the last ice age. Indigenous groups in the far north used yellow cedar, and sometimes hemlock.

House builders preferred red cedar because it had many useful properties including being incredibly durable in the damp climate of the Pacific Northwest. Red cedar is fragrant and insect resistant. Red cedar is a soft but firm wood making it ideal to carve. An old-growth tree can be split cleanly into forty-foot

planks with clear straight grain and no knots. After it dries, red cedar is light in weight and full of fragrant oil making it one of the longest lasting woods in the northwest (Nabokov & Easton, 1989).

Even though many similarities exist between indigenous groups in the Pacific Northwest, house shapes, construction details, and symbolic decorations of each region-- and often in each tribe – displayed distinguishing characteristics clearly separating regions, tribal groups, and even families.

The best known and most studied of the Northwest coast plankhouses belong to the Northern peoples of Southern Alaska and Northern British Columbia. The longhouses in the North typically fell into a few distinct design types. All Northern longhouse types were gable-roofed structures most using either a two, four, or six-beam frame. The Tlingit and Tsimshian constructed similar gable-roofed houses using a four-beam system while the Haida of Queen Charlotte Islands also used a four-beam frame they created a unique six-beam house that was used by no other group.



Photo on the left: Haida six-beam frame and entryway. Haida Gwaii 1897, National Museum of the American Indian Photo on the right: Tlingit four-beam frame, Prince of Whales Island. Date unknown NMAI

The photo on the left shows a six beam Haida frame while the photo on the right shows a Tlingit four-beam frame. The Haida house entryway is a bear with an eagle on top, with wolves the posts (although they could also be bears, it is difficult to tell from the angle of this photo). If you notice in the Tlingit photo

the center post also depicts a bear at the base with an eagle above. This photo also shows rectangular beams and straight lined supports. This house was likely built using milled lumber after European contact. The house also features an excavated floor. Found all along the Pacific coast excavated floors were common for many groups and served to regulate temperature within the longhouse.

Northern and Central gable-roofed plankhouses

Elaborately carved and painted exteriors including front panels and totem poles distinguish northern style longhouses. Exquisitely carved and painted interiors typified these longhouses. Longhouses in the central areas of the Pacific Northwest tended to be less elaborately decorated on the exterior, likely due to the fact, that people removed their roofs and walls during summer months for other uses. Support beams and entryways, part of the permanent frame, were often beautifully carved and crafted, telling the stories of the occupants and showcasing wealth and status. Interior carved and painted panels served as dividers to separate high status families within the multi-family dwelling, as well as to serve as backdrops for social gatherings. These panels also told the story of the owners and indicated lineage, wealth, and status.



Haida Chief Sonihat's house frame. Kasaan Alaska 1938. University of Washington Library digital collection



Haida six-beam house and totem poles, Haida Gwaii 1884, National Museum of the American Indian.

This is likely a chief's house as indicated by the top figures of the poles. These depictions of human figures wearing tall ringed hats indicate chief status. The bear on top of the other pole likely indicates the occupants belong to the bear clan.



Haida six beam longhouses, Unknown Location (likely Haida Gwaii), unknown date, National Museum of the American Indian.

This photo is mislabeled as Vancouver Island, which it clearly is not. The style of the longhouses with their six beam structure as well as the artistic style of the totem poles clearly represents Haida carving and design.

Note: Each totem pole is different depicting different families and lineages. The second pole from the right advertises the chief's house as noted by the human figure on top of the eagle. This figure is carved wearing a tall ringed hat, indicating chief status.



[Koh-Kluk's big house, Klukwan Alaska 1894, University of Washington digital archives.](#)

The exquisite carvings include house posts, house panels, giant feast bowl, bent-wood boxes and masks. The man in the back on the left is wearing a ringed hat, he is likely the head chief of this house.



**Interior of Kwakwaka'wakw four-beam longhouse, Blondin Harbor, British Columbia, 1951?
National Museum of the American Indian.**

Notice the carved guardian figure at the door as well as the loose roof planks and floor planks. This house typifies the central style of Northwest Coast Longhouses. This house was likely built after European contact indicated by use of the rectangular door and the window.



House posts, Kwakwaka'wakw (Kwakiutl) 1926 Vancouver Island British Columbia, National Museum of the American Indian.

The posts in the foreground depict humans, while the posts in the background depict humans on the bottom and either eagles, but more likely thunderbirds on top. (The hooked beak indicates the figures are thunderbirds.)



Houseposts, Kwakwaka'wakw (Kwakiutl) 1926 Vancouver Island, National Museum of the American Indian.

The house posts depict bears on the bottom, holding humans, likely signifying guardianship over the human occupant. Ravens perch atop the bears. The posts in the background have the same motif but different design with the wings folded to the side and both the bears and ravens have different features such as eyes and teeth, they were likely carved by a different carver. Also notice how there is a built in step between the posts, the floor of this house was excavated, which had a variety of benefits such as temperature control, increased space including storage space and a place to be out of the wind or any draft that may come through cracks in the walls.



View of longhouse frame mid-construction. Kwakwaka'wakw (Kwakiutl) 1878, Vancouver, British Columbia, National Museum of the American Indian

Notice in the photo above the notch on the center beam. This notch insures the beam will fit properly and not roll. The lines that can be seen on the support posts which form the entry way the result from expert adze work (a form of carving). Notice the carved support posts at the back of the longhouse as well as the planks around the edges. These planks will be used to support the walls in an interlocking, shingle style system. The canoe in the foreground and the person in the background, give you an idea of the scale of this house, this style of dugout canoe would typically be 25 to 40 feet in length.



Kwakiutl 4-beam house frame 1910, Library of Congress Note: Notice the adze marks on the rafters, this was done to “even out” the beams making them essentially the same diameter from end to end. This shows the gable frame style of house, essentially two shed-roof houses



The map on the left shows the historic range of Coast Salish peoples as well as their current tribal names and areas. (Stonington, 2010)

Salish shed-roof houses

In 1792 Captain George Vancouver explored Elliot Bay in what is now Seattle. He landed on shore to examine an indigenous dwelling whose single-pitch shed roof was home to over six hundred Dwamish, and Suquamish. The house known as Tsu-Suc-Cub (Old-Man-House) extended more than 380 yards in length- almost a fifth of a mile. The Old-Man-House was divided lengthwise into eight sections, each housing a separate clan and identified by prominently displayed carved figures (Nabokov & Easton, 1989).



[Artist rendition of Old Man House, Suquamish Tribal department of History and Culture](#)

Old-Man-house, a shed-roof structure was the largest long house on the northwest coast. George Gibbs estimated the structure to be 520 feet (158.5 meters) long, 60 feet (18.3meters) wide, 15 feet (4.6 meters) high in the front and 10 feet (three meters) high in the rear, supported by 74 large house posts, some of which were carved (Suquamish, Suquamish Tribe department of history and culture). Suquamish elders stated that Old-Man-House was built by Schweab, the father of Chief Seattle, and by Chief Kitsap, another Suquamish leader. Old-Man-House took over four years to build, and likely took much longer as sections would be added to the ends as needed.

Old-Man-House was destroyed by around 1870. Most accounts attribute the destruction to the Indian Agent who enforced federal policies on the Port Madison Indian reservation. Other accounts say the federal government

destroyed Old Man House to discourage extended multi-generation families from living together in one house (Suquamish, Suquamish Tribe department of history and culture). Old-Man-House was one of the last great Salish longhouses. Its destruction essential wiped out Salish longhouses and communal living for Salish peoples in Washington State. The destruction of Old-Man-House also destroyed important archeological and architectural knowledge about Salish life, and Salish architectural design and construction.



Old-Man-House, Date unknown, Suquamish Tribe



Some posts from Old-Man-House remained standing through the early 1900s, Suquamish Tribal department of History and Culture



Engraving from 1792 showing Salish longhouses, University of Washington digital collection