The Original "Free Trade": Exchange of Botanical Products and Associated Plant Knowledge in Northwestern North America

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Abstract: Long-standing and far-reaching trade networks for culturally important plants are documented for British Columbia and neighbouring areas from archaeological, historical and ethnographic records, as well as recollections of contemporary Aboriginal people. Plant resources and products manufactured from plants comprised a substantial portion of traditional and contemporary traded goods. Examples include: dried edible seaweed, commonly traded from coastal communities inland; dried soapberries, saskatoon berries and other berries; hazelnuts; cedar-root and cedar-bark baskets; basket materials; and Indian-hemp fibre and twine. In addition to the plant materials, knowledge associated with these resources was exchanged, and trade has had cultural and ecological implications extending well beyond simple subsistence.

Résumé: Dans cet article nous présentons les réseaux d'échange, de longue date et de grande portée, de plantes culturellement importantes de la Colombie britannique et de régions adjacentes à partir de sources archéologiques, historiques et ethnographiques et de souvenirs d'autochtones contemporains. Les ressources végétales et les produits d'origine végétale formaient une partie substantielle des produits échangés traditionnellement et de façon contemporaine. Les exemples présentés incluent: les algues marines comestibles séchées, échangées couramment entre les communautés de la côte et celles de l'intérieur; les pommes de savon, les petites poires et autres petits fruits séchés; les noisettes; les paniers en racine de cèdre et en écorce de cèdre; les matériaux pour fabriquer les paniers; et la fibre et le fil du chanvre du Canada. En plus des matériaux d'origine végétale, des connaissances associées à ces ressources étaient échangées. L'échange eut de nombreux effets culturels et écologiques et n'était pas restreint à la simple subsistance.

Introduction

> Trade between villages was necessary to provide a continuous supply of food and accumulate wealth. Goods were exchanged by sharing, bartering, or trading a gift for a gift. Trade included sharing land that had a profusion of berries or hunting grounds full of game. As there was an abundance of seafood on the coast, and similarly, an excess of meat and berries among the Gitksans, the exchange offered variety in our diets. (Watts, 1997: 1)

Indigenous peoples around the world have a cultural heritage that includes extensive and intimate familiarity with their local environments. Such knowledge is an essential attribute of societies that not only have survived, but have thrived, in close connection with the natural world (Inglis, 1993; Williams and Baines, 1993). However, few, if any, natural environments provide a complete and reliable array of resources to a given group of people at a given time. Trade has long been recognized as a means of countering instabilities in resource supply and abundance, and of introducing variety to those resources. Indigenous peoples of North America certainly have been well acquainted with the advantages of trade. Archaeological and historical records show that they developed extensive and sophisticated trading networks and institutions dating back thousands of years. However, the pervasive nature of Indigenous trade, and its many implications both before and after contact have rarely been explicitly considered. In particular, the importance of exchange of various types of plant resources, technologies and knowledge has received little direct attention.

In this study, we discuss plant exchange, in a broad context, among Indigenous peoples of British Columbia and adjacent areas. General characteristics of this exchange are delineated, as well as its cultural and ecological significance both in the past and today. Information is

derived from available archaeological, ethnographic and historical data, as well as documented consultations with Aboriginal people in recent decades. Whereas the focus of the article will be on what appears to be "traditional" exchange of plant resources among Indigenous peoples, post-contact and contemporary changes and interactions with non-Native people will be considered as well. However, it is important to note that, since most of the evidence is non-archaeological, it is not always possible to distinguish "pre-contact" and "post-contact" exchange phenomena. It must also be emphasized that the consideration of "plant exchange," apart from exchange in other resources, is an artificial separation for the purposes of this work. In reality, all types of trade products were linked inextricably in transactions.

The Nature of Indigenous Plant Exchange

What Is Exchange?

Earle (1982: 2) defined exchange as "the spatial distribution of materials from hand to hand and from social group to social group." Indeed, the reciprocal acquisition of material goods is a key aspect of exchange, and the role of plant resources (e.g., food, materials, medicines, manufactured goods) in this regard will be discussed in greater detail in later sections. However, a broader perspective of exchange will be taken here. In addition to the physical give and take of material goods, technological skills were transferred from person to person, and from group to group, as were names and vocabulary for items, skills and associated concepts in different languages and cultures. The transfer of plant materials has a unique facet, because some plant propagules are long-lived and therefore plants, far more than animals, may be readily established in other areas. Thus, "plant exchange" extends beyond cultural transfer to biological transfer or dispersal (as discussed later).

Exchange seldom took the form of a simple gain-maximizing transaction among Indigenous peoples.[1] Rather, the broader social context was, and is, of key importance. For example, a good deal of nonconsensual transfer of knowledge and goods took place as a result of war and raiding activities. Not only was booty taken, which included many plant materials and products, but slave trade was also common through much of northwestern North America (Donald, 1997; Suttles, 1990). Undoubtedly, slaves had a significant influence on the diffusion of language and knowledge to their captors.

On the other extreme much exchange took the form of gifts, or help to those in need, with the understanding that one could expect reciprocation at some point in the future. This type of interaction was encouraged and sustained by extensive ties of intermarriage and ceremonial exchange among many groups (cf. Suttles, 1987a, 1987b). Oberg (1973) distinguished between *gift exchange*, which takes place within a network of social relationships, and *barter* or *trade*, in which individuals seek their own advantage through bargaining without regard for any system of relationships that makes them members of a community. Oberg felt that pure barter did not exist for the Tlingit[2] before the Europeans came, and similar conclusions have been reached for other groups, such as Drucker's (1951) interpretations of Nuu-Chah-Nulth practices. However, Mitchell and Donald (1988) feel that in fact, an early sophisticated trading system among Northwest Coast peoples may have existed, with "trading" used in the above narrow sense. Some trade transactions were disguised by means of elaborate rituals as gift offerings (see, for example, John Jewitt's description of Nuu-Chah-Nulth trade rituals in Stewart [1987: 100]). Bartering, while perhaps subtle, also clearly existed in other groups (Decosse, 1980; Sewid-Smith and Dick, in press; see also the quotation at the beginning of the introduction to this article).

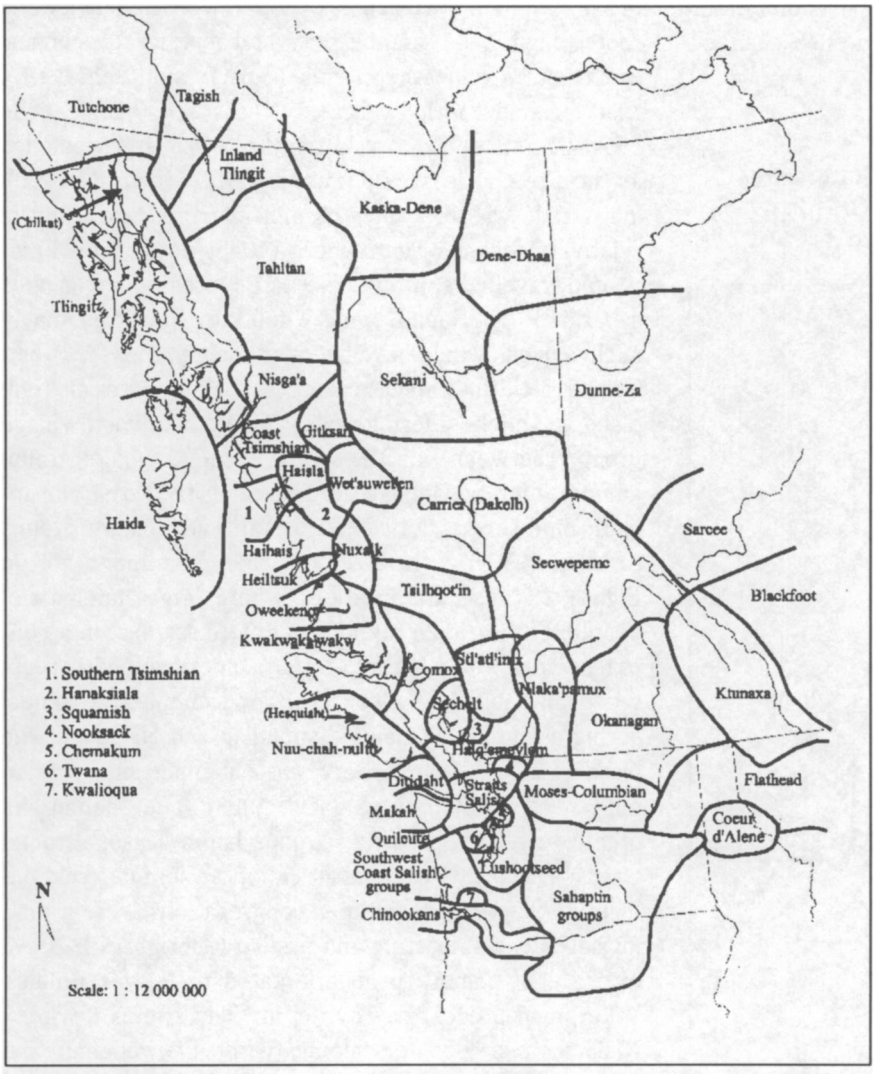
The relative contribution of social and economic factors in exchange/trade continues to be a topic of theoretical interest. This issue appears to be analogous to the nature vs. nurture "debate," in that both factors are clearly important, and are interrelated in complex ways. The present discussion of plant exchange correspondingly provides numerous examples of the economic significance of exchange, but the social context can never be ignored. Trade was influenced by, and in turn influenced, social relations, for example, intermarriage, political alliances and peace-keeping. As noted by Decosse (1980: 79), "While the desire for trade goods was responsible for initiating social interactions, it was the latter which sustained the material flow."

Given the interrelatedness of social and economic factors, and the apparent presence of both "gift exchange" and "barter or trade" in peoples of northwestern North America, these terms are not used in the sense of Oberg (1973) in this study. Rather, "exchange" and "trade" are used essentially interchangeably, with the former being a more general term to include transfer of non-physical items. For example, much knowledge and information would have been transferred from one group to another during the course of trade or other social intercourse.

Extent of Plant Trade

There is considerable evidence that established that far-reaching Indigenous trade networks existed in northwest-

Figure 1
Map of Northwestern North America Showing Territories of the Indigenous Groups of the Study Area



Note: Hesquiaht and Chilkat are subgroups of Nuu-Chah-Nulth and Tlingit, respectively.

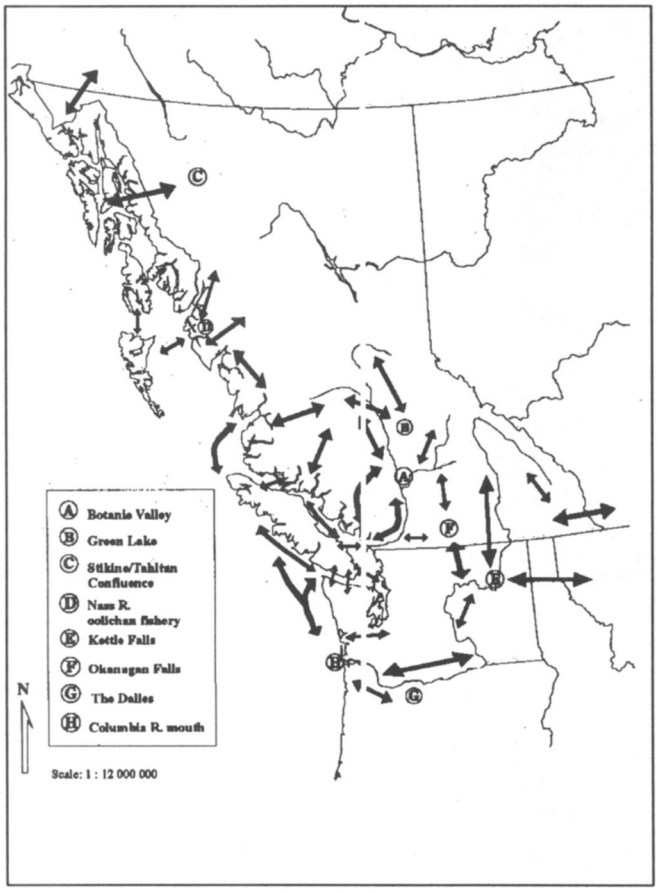
ern North America. Archaeological evidence (cited by Mitchell and Donald, 1988; Stewart, 1987) from obsidian, dentalia shells and other mineral materials indicates that these networks are at least 2 000-3 000 years old, and have extended over distances as great as 1 000 kilometres. The comments of early explorers and other non-Native visitors to the Northwest also indicate that Native groups were well acquainted with the concept of trade and were in frequent contact with one another. For example, Gilbert Sproat, who lived on Vancouver Island in the 1860s, noted:

> All the natives are acute, and rather too sharp at bargaining.... News about prices, and indeed about anything in which the natives take an interest, travels quickly to distant places from one tribe to another. If a trading schooner appeared at one point on the shore, and offered higher prices than are usually given, the Indians would know the fact immediately along the whole coast. (Sproat, 1987: 58)

Figure 1 shows the locations of Indigenous groups in the study area, and Figure 2 shows various trade routes that appear to have been commonly used before contact with Europeans. Moreover, the geographical ramifications of exchange often extended much further. For example, many items were successively traded via "middlemen"; dentalia from the coast were transferred to locations as far inland as the Great Plains (Stewart,

1987). The arrival of horses brought changes in trading patterns, frequency and intensity; some ethnographic sources, such as James Teit's works, explicitly indicate these changes. Establishment of trading posts and other trading facilities by European newcomers also changed traditional patterns in many cases.[3]

Figure 2
Some Examples of Aboriginal Trade Routes and Main Centres of Trade in Northwestern North America (Compiled from Various Sources)



Trade of plant resources almost certainly was concomitantly ancient and widespread, although archaeological evidence is scanty for these perishable items. John Jewitt, who was held captive in the early 1800s at Nootka Sound for several years by Nuu-Chah-Nulth Chief Maquinna, stated in his July 6, 1805 journal entry that dried cakes of salal[4] berries were an important trading item among villages, and that three large baskets of "an excellent fruit . . . *Quawnoose*" (actually cooked, dried bulbs of blue camas) were brought by "*Kla-iz-arts*" (Coast Salish) peoples nearly 480 km to the south (Stewart [1987] notes that the distance was actually about half that given by Jewitt).

More recent ethnobotanical surveys document similarly long-ranging trade routes. For example, some Kwakwaka'wakw groups once travelled up to 160 km in order to obtain springbank clover rhizomes, silverweed roots, high bush cranberries, crabapples, soapberries, camas bulbs and other items (Turner and Bell, 1973). Also, Annie York indicated that her people, the Nlaka'pamux, obtained wild rice from Plains groups such as the Cree, at least 500 km away (Turner et al., 1990). This trade was probably through intermediaries, and of relatively recent origin. Oberg (1943) notes the Tlingit people travelled south in their large, ocean-going canoes as far as Puget Sound, some 1 400 km away. Presumably such voyages would have been for trade purposes.

On a cultural level, exchange of plant materials took place on widely differing scales: within family and village groups; between villages in the same language group; among different language divisions on the coast and inland; and even between coastal and inland groups (Turner, 1979). "Nodes" of trade are indicated on Figure 2; these are locations where large numbers of people, often from a number of different tribes in a general region, would gather to trade, socialize and harvest seasonally abundant resources. For example, the annual spring assembly of Haida, Tsimshian and Nisga'a at the Nass River oolichan fishery was an important occasion for trade (Mitchell and Donald, 1988). The Tahltan and other western Athapaskan groups had a seasonal round characterized by yearly aggregation at summer salmon-fishing villages; the summer congregations were a time for ceremonies, feasting and trading (Albright, 1984). An example of a more plant-orientated node was Botanie Valley, near present-day Lytton in Nlaka'pamux territory. Nlaka'pamux people, along with Secwepemc and Stl'atl'imx people, would gather there in summer largely due to the great abundance of a number of different "root" vegetables and berries (Turner et al., 1990). According to Teit (1900), as many as 1 000 people would congregate annually at Botanie. Women would gather plant foods, men would hunt and everyone would trade and socialize. Louie Phillips recalled that Nlaka'pamux women in his community would sometimes bet whole sacks of yellow avalanche lily bulbs on the outcomes of horse races in the valley—an interesting type of exchange mechanism (Turner et al., 1990). Botanie Valley continued to be an important gathering place well after contact, as indicated by Mary Williams, also Nlaka'pamux:

> In the month of August, the people gathered up in Petáni. People gathered from all over—Spences

> Bridge, Nicola, and 30 Mile [30 miles north of Lytton on the Fraser River].... The bishop came up there too, and joined in the sports with the people.... My, we used to have nice times in those days! Everybody was happy and no one was afraid of anything. Now we are scared when we go up there. At times, good White people would come up and watch the people's races. There would be tents everywhere. (Hanna and Henry, 1996: 149)

In the case of coastal/inland trade, the groups of people travelling to trade were generally smaller, but visits were often temporally extensive. Decosse (1980) discussed Athapaskan-Tlingit trade relations and noted that trade expeditions were major undertakings requiring weeks of preparation, including fasting and other rituals. The trade encounters generally lasted from three to six weeks, but a coastal trader occasionally stayed with his inland partner as long as a year; such visits undoubtedly encouraged a great deal of cultural (knowledge and language) transfer in addition to exchange of the goods. During the final festivities of these trade gatherings, the guests would ask their hosts to teach them new songs, and a few days would be spent perfecting these before the guests departed (Decosse, 1980). Similarly, John Jewitt (Stewart, 1987: 99) noted that the Kwakwaka'wakw traders who came to Nootka (Yuquot) "were accustomed to remain a much longer time at Nootka than the other tribes ... and on these occasions taught their songs to our savages." Greer (1995) suggested that the stories and songs shared during the trading sessions of precontact times were valued just as much as the goods exchanged.

Types of Plant Resources Traded

There has been an increasing awareness of the importance of plant resources as food, materials and medicines in hunter-gatherer economies (Hunn, Turner and French, 1998; Lee and Daly, in press). For example, Mitchell and Donald (1988: 301) note that, given the widespread importance of cedar as a material resource, "access to a stand of red or yellow cedar was likely as important as access to a clam bed or herring spawning ground." Therefore, it is not surprising that a wide array of plant resources would also be a fundamental component of exchange. Table 1 provides documented examples of plants and plant products known to have been traded among First Peoples of northwestern North America. Over 65 plant species are included, most of which are foodstuffs or materials for use in technology. Additional items are in the form of manufactured goods. Most trade was in processed or preserved products, the difficulties of transporting fresh plants over long distances being obvious. The major types of plant products traded are discussed in greater detail in the following sections.

Plant Foods

Exchange of food resources within groups was, more than with other resources, generally a matter of sharing rather than a formal transaction. As Elmendorf (1960) noted for the Twana, it was proper to be generous with members of one's own village. An example of this type of generosity was noted for the Nlaka'pamux by Turner et al. (1990); people from the Upper territory would bring "Indian celery," a favourite green vegetable more common in their area, to their friends in Lower territory when they came down the Fraser Canyon in spring.

Among groups, there was often more formal trade in food items. This exchange generally diversified the diet rather than supplying a vitally needed foodstuff (Elmendorf, 1960), although many items were obtained regularly and in quantity. Sweet foods and novelty foods were particularly popular; commonly traded plant foods included soapberries, used to make a popular whipped confection known today as "Indian ice cream" (Figure 3); saskatoon berries, often eaten with meat; and camas bulbs, a potato-like food with a sweet flavour when cooked[5] (Figure 4). A number of plant foods were valued highly; for example, bitterroot (Figure 4) was noted as being "expensive stuff" by Annie York, Nlaka'pamux, who said that a 1.5-m string of dried bitterroot would be worth about one salmon in the early part of the 20th century (Turner et al., 1990). In the late 19th century, James Teit (1900) found that "ten bundles" of bitterroot could be exchanged for one large, dressed buckskin. Other highly valued food items were edible seaweed, preserved crabapples and highbush cranberries, black huckleberries, hazelnuts (Figure 5) and green shoots of salmonberry and thimbleberry (Turner, 1995, 1997).

Plant Materials

Raw or processed plant products used for basketry, canoe making and other technologies, were also important in trade. The importance of western red cedar, whose wood, inner bark, withes and roots were all important materials, has already been noted, and all these parts in raw or processed form were traded (Figure 6). Indian-hemp, a fibre plant, was also widely traded; a good twine made from this fibre is as strong as modern synthetic cordage with 100 kg (200 pounds) or more test weight (Turner, 1979). The value of this plant was indicated by James Teit (1900), who recorded that items for which

Table 1
Specific Plant Resources (Listed Alphabetically by Common Name) Traded among Indigenous Peoples in British Columbia and Neighbouring Areas in Northwestern North America[a]

Material/Item Traded	Notes
avalanche lily, glacier lily (*Erythronium grandiflorum*)	dried bulbs traded, among Interior Salish, and from Tsilhqot'in to Carrier and Nuxalk
balsamroot (*Balsamorhiza sagittata*)	dried roots traded among Nlaka'pamux and probably Stl'atl'imx
beargrass (*Xerophyllum tenax*)	bundled leaves and finished baskets, traded from Olympic Peninsula to Vancouver Island
birch, paper (*Betula papyrifera*)	bark, containers, wood traded among Athapaskan and Interior Salish groups and from interior to coast; birch bark canoes traded among Interior Salish, Ktunaxa and Athapaskan peoples
biscuitroot (*Lomatium cous* and other spp.)	dried roots traded within interior plateau groups, especially from southern to northern plateau
bitterroot (*Lewisia rediviva*)	dried roots commonly traded within and among Interior Salish groups, BC and Washington
blueberries (*Vaccinium* spp.)	dried berries traded among Coast Salish; from interior to central coast; within various interior groups
edible camas (*Camassia leichtlinii, C. quamash*)	dried bulbs widely traded from Coast Salish of Vancouver Island to west coast, north coast and mainland; also among southern Interior Salish, Columbia River and western Washington peoples, north into Canadian Plateau; bulbs transplanted to some west coast locations
cat-tail (*Typha latifolia*)	mats traded among Interior Salish and southern NW coast peoples and from coast to interior
cedar, western red (*Thuja plicata*)	cedarwood dugouts widely traded on NW coast and into interior; cedarwood boxes traded along NW coast, in general from north to south and from coast to interior; bark and bark baskets, mats, robes, ceremonial articles traded widely among NW coast peoples and from coast to interior; roots and split root baskets traded among Interior Salish and Columbia peoples and from interior to coast
cedar, yellow (*Chamaecyparis nootkatensis*)	bark and bark products widely traded along the NW coast and into interior, especially in Chilkat blankets and robes; wood for bows traded from Coast Salish to interior; wood for ceremonial articles traded from northern NW coast into interior
celery, Indian (*Lomatium nudicaule*)	seeds traded from southeast Vancouver Island to west coast and northeast coast of Vancouver Island; greens traded among Nlaka'pamux peoples
cherry, bitter (*Prunus emarginata*)	bark traded from groups of southern coast of BC to central coast; bark as basket decoration exchanged among Interior Salish
chocolate lily, "riceroot" (*Fritillaria lanceolata*)	dried bulbs traded from Upper to Lower Nlaka'pamux
choke cherries (*Prunus virginiana*)	dried cherries traded among Interior Salish and coastwards to Fraser Valley
cloudberries (*Rubus chamaemorus*)	berries preserved in water traded from Tsimshian to Haida
clover, springbank (*Trifolium wormskioldii*)	rhizomes traded from Nuxalk to Oweekeno and Hanaksiala; also within Kwakwaka'wakw communities
cottonwood (*Populus balsamifera* ssp. *trichocarpa*)	dugout canoes traded among Interior Salish peoples; wood traded from Tsimshian to Haida
crabapples, Pacific (*Malus fusca* syn. *Pyrus fusca*)	fresh and preserved fruits in water or oolichan grease widely traded along NW coast and from coast to interior
cranberries, bog (*Vaccinium oxycoccus*)	fresh and preserved fruits in water or oolichan grease widely traded along NW coast and probably among interior peoples
cranberries, highbush (*Viburnum edule*)	fresh and preserved fruits in water or oolichan grease widely traded along NW coast and from coast to interior
currants, wild (*Ribes* spp.)	traded (dried?) among Interior Salish peoples
desert parsley (*Lomatium macrocarpum*)	dried roots traded among Interior Salish peoples
fungus, paint (*Echinodontium tinctorium*)	traded from Tlingit to Athapaskan groups
grass, reed-canary (*Phalaris arundinacea* and other spp.)	traded as basket decoration material, and in finished cedar-root baskets among Interior Salish peoples, and from interior to coast in the south
hazelnuts (*Corylus cornuta*)	nuts widely traded among Salishan groups of BC and among Columbia River peoples
hemlock, western (*Tsuga heterophylla*)	dried inner bark food traded from Tsimshian to Nisga'a; from Haisla and Hanaksiala to other coastal groups
huckleberries (esp. *Vaccinium membranaceum*)	berries widely traded among Salishan peoples of BC and among Columbia River peoples

Table 1 (continued)

Material/Item Traded	Notes
Indian-hemp (*Apocynum cannabinum*)	fibre, twine and woven products widely traded among Interior Salish, and from Plateau to NW coast; from Coeur d'Alene to Plains tribes
kinnikinnick (*Arctostaphylos uva-ursi*)	berries traded from Nuxalk to Heiltsuk and Oweekeno, and probably elsewhere in BC; dried leaves as tobacco probably also traded
Labrador tea, swamp tea (*Ledum* spp.)	dried leaves traded among various interior peoples
lichen, black tree (*Bryoria fremontii*)	cooked, dried cakes traded from Interior to Coast Salish
lichen, wolf (*Letharia vulpina*)	traded as dyestuff among interior groups and from interior to NW coast
maple, vine (*Acer circinatum*)	wood for bows traded from NW coast to interior, southern BC
maple, Rocky Mountain (*Acer glabrum*)	wood traded from Tsimshian to Haida
mock-orange (*Philadelphus lewisii*)	wood for arrows, needles traded by Upper Stl'atl'imx to Secwepemc
nettle, stinging (*Urtica dioica*)	fibre, twine traded from Hanaksiala and Haisla to Nuxalk and Coast Tsimshian; living plants transplanted from one village to another
onions, wild (*Allium cernuum* and related species)	bulbs traded among Nlaka'pamux; not generally eaten by coastal groups but traded in abundance to Europeans
Oregon ash (*Fraxinus latifolia*)	bowls traded to the Makah from groups to the south and/or east
pine, ponderosa (*Pinus ponderosa*)	dugout canoes traded within Nlaka'pamux
rice, wild (*Zizania aquatica*)	traded from "Indians of the Rocky Mountains and Great Plains," especially the Cree, to Nlaka'pamux (and others?)
salal (*Gaultheria shallon*)	large quantites of dried berries and pressed cakes traded among NW coast peoples
salmonberries (*Rubus spectabilis*)	berries traded from Halq'emeylem to Lower Nlaka'pamux; sprouts exchanged locally among Nuu-Chah-Nulth
saskatoon berries (*Amelanchier alnifolia*)	dried berries and cakes commonly traded among interior peoples, and from interior to coast, especially central and southern coast
seaweed, edible (*Porphyra* spp.)	important item of trade along entire NW coast (especially central and northern) and from coast inland; sold by Saanich, Nuu-Chah-Nulth to oriental buyers from Victoria
silverberry (*Elaeagnus commutata*)	bark, mats and bags traded among Interior Salish, and from Interior to Coast Salish
silverweed (*Potentilla* spp.)	*P. anserina* roots traded from Upper to Lower Nlaka'pamu; *P. pacifica* roots widely traded among NW coast peoples
soapberries (*Shepherdia canadensis*)	widely traded as dried cakes, and jarred in water, among many groups in British Columbia, especially from interior to coast, from mainland to Haida Gwaii
spring beauty (*Claytonia lanceolata*)	corms commonly traded within and among interior groups
spruce (*Picea* spp.)	gum (*P. glauca*) traded from Athapaskan groups to the Tlingit for chewing; root baskets, hats (*P. sitchensis*) from Tlingit to Athapaskan groups and from Haida to Tsimshian
thimbleberry (*Rubus parviflorus*)	sprouts exchanged locally among Nuu-Chah-Nulth
"three-square," "sweetgrass" (*Scirpus americanus*)	dried leaves traded among Vancouver Island peoples and to Olympic Peninsula
tiger lily (*Lilium columbianum*)	dried bulbs traded from Interior Salish to Coast
tobacco, native (*Nicotiana attenuata* or *N. quadrivalvis*)	*N. quadrivalvis* traded from Haida, Tlingit to Tsimshian; from Metlakatla Tsimshian to Nisga'a; *N. attenuata* among Interior Salish
tule (*Scirpus acutus*)	tule mats widely traded, especially among Interior Salish
wapato (*Sagittaria latifolia*)	tubers widely traded from Lower Fraser Valley and Lower Columbia inland and along the NW coast
willow-bark twine (*Salix* spp.)	bark twine traded from Lower Stl'atl'imx to Halq'emeylem
yew, western (*Taxus brevifolia*)	wood and bows commonly traded from NW coast to interior throughout range

a Compiled from the following references and citations within: Albright, 1984; Birchwater et al., 1993; Boas, 1923; Compton, 1993; Darby, 1996; Decosse, 1980; Edwards, 1979; Elmendorf, 1960; Gunther, 1945; Huelsbeck, 1988; Hunn, 1990; Mitchell and Donald, 1988; Norton, Boyd and Hunn, 1983; Oberg, 1973; Olson, 1935, 1954; Palmer, 1975; Ray, 1938; Smith, 1920-23; Sproat, 1987; Steedman, 1930; Stewart, 1987; Suttles, 1951a, 1987a; Swan, 1869; Teit, 1900, 1906, 1909; Teit and Boas, 1973; Turner, 1978, 1979, 1992, 1995, 1996, 1997; Turner and Bell, 1973; Turner and Efrat, 1982; Turner and Ignace, 1993-97; Turner and Kuhnlein, 1983; Turner et al., 1983, 1990; as well as personal communications to NT from Elsie Claxton (1996), Mary Thomas (1993-97); Annie York (1985-89). References cited are restricted to those in which the species traded were identified and Aboriginal groups were specified.

Figure 3

Soapberries and "Indian ice-cream." Dried and jarred soapberries have been widely traded in British Columbia.

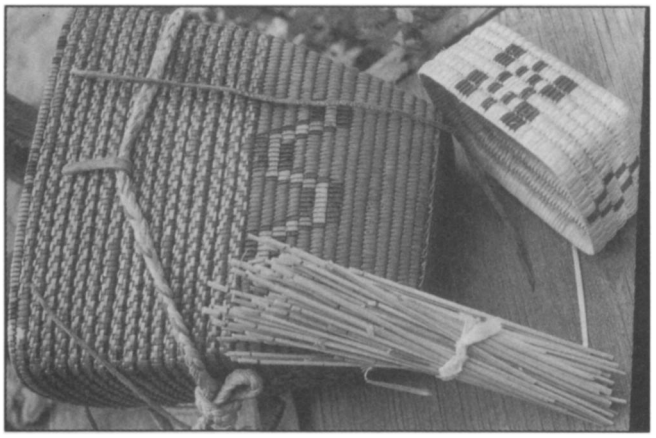
Figure 4

Dried biscuitroot (left), bitterroot (top) and camas bulbs (right) were a common trade item within the Interior Plateau, traded generally from south to north. Camas was widely traded along the coast as well.

Figure 5

Baskets of hazelnuts and other foods were a common trade product.

Figure 6



Coiled baskets of split red-cedar roots, decorated with bitter cherry bark, and reed canary grass stalks, were a specialty of Lower Nlaka'pamux and Lower Stl'atl'imx basketweavers, and were exchanged with both coastal and interior peoples.

five "packages" of the fibre could be exchanged included one large cedar-root basket, two salmon-skins full of salmon-oil, three sticks of salmon, one large dressed buckskin, one steel trap or one canoe. Basketry "grasses" were also highly valued. Bear-grass, for example, was a major item of export from the Makah and other peoples of the Olympic Peninsula to Vancouver Island; the Ditidaht and Nuu-Chah-Nulth basketweavers sometimes called it "American grass," as contrasted with the more readily available *Carex obnupta*. As noted later, the leaves of bear-grass are still bought and sold today.

Plant Medicines

Unlike food and material plant resources, medicinal plants and prepared medicines were apparently seldom widely traded, although some medicinal plants are widely known and used similarly by many people of different groups. Many Indigenous peoples believed that the effectiveness of medicines was directly dependent on a high degree of secrecy surrounding them, not only in terms of preparation and administration information, but also of the actual identity of the plant used (Turner and Efrat, 1982; Turner et al., 1983; Turner et al., 1987). In many groups, sophisticated medicinal knowledge was held by a few herbal specialists, who did not share their medicinal recipes with clients, much less with strangers from other tribes. These recipes also tended to be highly specialized, with the details of preparation of a given medicinal plant unique to individuals or perhaps families in a given cultural setting (Compton, 1993). Such specific knowl-

edge probably meant that any exchange of medicinal plants would have been equally focussed, occurring among certain individuals and not often characteristic of whole groups. This type of exchange was well remembered by Mrs. Winnie Atlin for Tagish people:

> My mom and Maggie Coudenehha, she used to live in Skagway. She used to know lots, and my mom got a lot of stuff from her.... Like they used to trade, they would talk and stuff about medicines and all that.... They used to call each other sister. (Greer, 1995: 106)

However, properties of numerous medicinal plants used with good results for common maladies became common knowledge within and sometimes across groups. For example, it was widely known to coastal groups that licorice fern rhizome (*Polypodium glycyrrhiza*) was good to chew for colds and sore throats, and it was known over most of the Northwest region that cascara bark (*Rhamnus purshiana*) was an effective laxative. Such medicinal plants have differing distributions, and, one would expect, chemical and ecological variations that would influence their quality, and thus would have been likely candidates for exchange.

An example of a medicinal plant that was probably traded is Indian celery (or Indian consumption plant), which is called by variants of the name *q'eXmin* by both Salishan and Kwakwaka'wakw peoples along the east coast of Vancouver Island. It is known everywhere for its healing properties for coughs, colds and tuberculosis, and is also used ceremonially as a cleansing fumigant and for purification (cf. Turner and Bell, 1971, 1973). Use of this name in languages of two different families suggests that the plant itself or knowledge about it was exchanged, quite possibly through trade (but see later section for problems with linguistic evidence).

Other examples of trade of ceremonial and healing plants include the exchange of Canby's lovage (*Ligusticum canbyi*),[6] an important medicine for Interior Salish groups and Ktunaxa of British Columbia and Washington, and the occasional exchange of sweet grass (*Hierochloe odorata*) for ceremonial smudging, although the latter example may be relatively recent (Turner, Bouchard and Kennedy, 1980; Turner et al., 1990). Often, too, medicinal healers would bring their own medicines with them when travelling to a patient some distance away. For example, when Annie York (Nlaka'pamux) was injured near Spuzzum in the Fraser Canyon, her great-aunt, a well-known "Indian doctor," gathered bags of the roots of poisonous water-hemlock (*Cicuta douglasii*), and brought them from Spences Bridge by bus to treat her. There are undoubtedly many other examples of this type of exchange in medicinal practices, but these are seldom recorded. A medical practitioner was often rewarded with gifts of foods or manufactured items that included plant products (cf. Turner et al., 1983).

Plant Exchange as an Integrated Component of Trade in General

Even where plant products were not the primary item of interest in a trade transaction, they were often still an important component. For example, plant materials were used as packaging and containers for a variety of items (Turner, 1996). Red paint brought by the Kwakwaka'wakw to trade with the Nuu-Chah-Nulth was "carefully kept in close mat bags" (Jewitt in Stewart, 1987: 99), and the Lower Chinook traded dried shellfish strung on two-foot sticks of salmonberry wood (Ray, 1938). Also, some trade products were both of plant and animal origin, such as snowshoes and highbush cranberries and Pacific crabapples in oolichan grease (Compton, 1993; Mitchell and Donald, 1988) and herring roe on giant kelp (*Macrocystis integrifolia*) fronds or western hemlock branches (Compton, 1993). Finally, as noted previously, plant products were inextricably linked with other types of products in trade transactions. For example, baskets were traded by Nlaka'pamux people for dried herring eggs, clams and other coastal products (Turner et al., 1990), and ten cakes of saskatoons could be exchanged for one large buckskin (Teit, 1900).

Cultural Aspects of Indigenous Plant Exchange

Socio-economic Implications

Perhaps the most obvious and important effect of exchange is that it promotes a more even distribution of the land's and the peoples' resources, making a greater variety of foods, materials and skills available to people than would otherwise be possible (Turner, 1996, 1997; Watts, 1997). The following sections describe several ways in which this effect can be manifested, with particular attention being given to plant resources.

Obtaining Items Not Locally Available

This motivation for trade is familiar to anyone who has ever bought an imported banana or other tropical fruit at a local supermarket in North America. For Indigenous peoples, its significance was no less obvious. Different ecosystems support different species, many of which are highly desirable and even irreplaceable for human uses. Perhaps the most striking example of trade for this purpose was the coastal/inland trade in the Northwest.

Figure 2 shows that there were many such routes, often extending along major river systems (e.g., Fraser, Lillooet, Bella Coola, Skeena, Nass and Stikine) to allow passage through the Coast and Cascade mountain ranges (Turner, 1996). Interior peoples, including the Lower Stl'atl'imx, Lower Nlaka'pamux, Ulkatcho Carrier and Tsilhqot'in, traded such items as soapberries, saskatoon berries, avalanche lily bulbs, Indian-hemp, wolf lichen and tanned moose hides. In return, coastal peoples including the Halq'emeylem, Sechelt, Nuxalk and Coast Tsimshian peoples gave such items as fish oil, dentalia shells, edible seaweed, Pacific crabapples and cedar products. These items were in turn traded by the immediate interior and coastal neighbours to other groups farther inland (e.g., Secwepemc) and farther westward (e.g., Haida). The Nuxalk-Carrier Grease trails are a particularly well-known example of an ancient coast/inland trade network, and many of the old trails are still in use today for recreation, hunting and trapping (Birchwater et al., 1993).[7] The trails were named for the oolichan grease from the coast that was transported across them in large quantities; however, many other products such as dried meat, soapberries and the cedar boxes containing the grease were also involved in the exchange (ibid.).

Innumerable other trade networks, on various geographical scales, operated on the same principle of exchanging surplus local goods for another group's different surplus products. For the Nlaka'pamux people, for example, there were two major territorial divisions, "Lower" and "Upper," respectively reflecting the different vegetational characteristics of the Fraser Canyon area and the Plateau region to the north (Turner et al., 1990). As a result of these ecological differences, an active trade existed between peoples of the two divisions. The Upper people traded such goods as bitterroot, saskatoon berries, soapberries and whitebark pine seeds to the Lower people in exchange for items including hazelnuts, salmon oil, cedar bark and vine maple wood for making bows (Teit, 1900). On the coast, the unusual Mediterranean-type climate of the southeastern tip of Vancouver Island and the Gulf Islands resulted in the existence of resources unique to that ecosystem, such as camas bulbs. As noted by Sproat (1987: 58):

> An active trade existed formerly among the tribes of this nation [Nuu-Chah-Nulth], as also between them and the tribes at the south of the island and on the American shore. The root called camas, for instance, and swamp rushes for making mats, neither of which could be plentifully produced on the west coast, were sent from the south of the island in exchange for cedar bark baskets, dried halibut, and herring.

An interesting variation on this theme was a special type of exchange in which access to a resource (often a food resource) was shared. It was surprisingly common for one group to allow another access to its resources at a time of abundance, even if these resources were also items of trade. For example, Turner and Kuhnlein (1983) noted that the Ditidaht not only traded for camas, but also dug their own bulbs in Salish territory with permission of the Straits and Halq'emeylem people. Similarly, the Katzie (Halq'emeylem) of the Fraser Valley granted permission to people from up and down the Fraser to harvest wapato or gather cranberries on the bogs (Suttles, 1951a). According to Teit (1906: 232), the Lower Stl'atl'imx, when trading with the Sechelt, Squamish and Comox Coast Salish at Jervis Inlet or Howe Sound, "were allowed to pick berries, and to hunt and fish, as much as they liked." Finally, Compton (1993) stated that the Hanaksiala did not always have to obtain edible seaweed by trade. They had long-standing ties with the Southern and Coastal Tsimshian people, with whom they shared the use of an edible seaweed and halibut camp. Conversely, these Tsimshian people made oolichan grease with the Hanaksiala at another camp.

This "access sharing" took place within communities as well as among more extensive cultural groups. On the coast and in the interior, resource areas such as prime berry patches, "root" vegetable patches or stands of western red cedar could be owned by certain high-class individuals or families (Turner, 1996, 1997; Turner and Efrat, 1982). In some cases bountiful areas were apparently readily shared (Watts, 1997); in other cases, respect for private property meant that people did not even think about using others' land for harvesting, even with permission (Chief Adam Dick, Kwakwaka'wakw, personal communication to NT, 1996). Ownership practices varied considerably, and still need further investigation to determine how they were applied within groups, at particular localities and for specific resources.

In some instances, the form of compensation for harvesting in others' territories is obvious, such as the reciprocal access to resources in the Hanaksiala/Tsimshian case. In others, the benefits are not as clear. This situation supports Decosse's (1980) contention that it is necessary to take a broad perspective of potential benefits in an exchange situation (see also Mauss, 1990). Perhaps hosting other groups encouraged those groups to take the time and effort to travel to one's door, so to speak, with desired trade goods. Also, as noted by Suttles (1951a: 27) for the Katzie, even though no immediate compensation was exacted, "A host at one time and place is potentially a guest at another." As mentioned,

the social context is of the utmost importance. Generosity helped maintain strong social alliances, which had benefits not only in a political sense, but also for immediate survival. Albright (1984) pointed out for the Tahltan that if resource populations suffered a decline in one area, strong social alliances allowed families to hunt, and probably gather, with groups in other areas for a while. Generosity was like an insurance policy and could have not only beneficial, but even life-saving, consequences at a later date.

After European contact, some new plant resources were incorporated into Indigenous trading schemes. Perhaps the most notable example is the potato, which, after its initial introduction, was distributed by Indigenous peoples among themselves and was cultivated in many localities before Europeans appeared (Mackie, 1984; Suttles, 1951b). Mackie (1984: 102) cites an independent trader on the west coast in the 1850s, William Eddy Banfield, who recorded that, "An Indian trail connects one with the other [Cowichan with Ditidaht], and considerable intertraffic exists. The Cowichan bring potatoes across, to exchange for halibut and whale oil"[8] (Mackie's bracketed note). Similarly, Compton (1993) reports that the Nuxalk brought carrots, turnips and other introduced cultivated vegetables and dried salmon to Kitlope and Kemano in exchange for dried oolichans and oolichan grease.

Obtaining Items That Were Difficult to Access or of Inferior Quality Locally

In some cases, a plant species exists within a group's territory, but may be difficult to access. For example, the plant may be distributed sporadically and/or exist in inconvenient locations. Annie York (Nlaka'pamux) said of silverweed roots, "That's kind of hard to get here. You've got to go way up where these ponds [are] or go up to the Hudson Bay trail to get it. But it's . . . not much here" (Turner et al., 1990: 263). Thus, the Lower Nlaka'pamux generally acquired their silverweed roots via trade from Upper peoples. Alternatively, access to a resource might be difficult only for certain individuals in a group. Another Nlaka'pamux woman, Bernadette Antoine, recalled that her granny valued two different kinds of saskatoons, and used them in different ways. One was more difficult for her to gather herself, presumably due to the sort of habitat it favoured, and she would therefore often trade for berries of that variety (ibid.).

Alternatively, a species may be found within a group's territory, but the plants are of inferior quality (in terms of human use) than those in another territory. For example, the Makah of north coastal Washington traded for cedar products such as canoes and house planks with their Vancouver Island Nuu-Chah-Nulth relatives, and in turn traded these products farther south to other groups of coastal Washington. James Swan (1869: 4, 35), who lived with the Makah during the mid-1800s, stated:

> The houses of the Makahs are built of boards and planks, split from the cedar. These are principally made by the Indians of Vancouver Island, and procured by barter with them. There is very little cedar about Cape Flattery, and such as is found is small and of inferior quality. . . . The largest and best canoes are made by the Clyoquots and Nitinats [Clayoquots and Ditidahts] on Vancouver Island; the cedar trees being of a quality greatly superior to that found on or near Cape Flattery. Canoes of the medium and small sizes are made by the Makahs from cedar procured a short distance up the Strait or on the Tsuess River.

Similarly, in the interior Plateau region, the critically important fibre plant Indian-hemp was widely traded in spite of its wide (though scattered) distribution in that region. It was known that there were great local variations in quality and abundance of Indian-hemp. According to Turner et al. (1990; Turner and Ignace, 1993-97), the best Indian-hemp was traded to areas where it either did not grow, or was of too low quality to be used.[9] Annie York (Nlaka'pamux) noted:

> Oh, you get them from upcountry. You trade. We have the milkweed [Indian-hemp] here [at Spuzzum], but not many. . . . Ours are short. . . . You get it from upcountry, some of them are as tall as that [about 1.5 m] and some of them are as thick as my thumb. . . . The people there, they gather them, bulk like this, and then they bring that down here. . . . (Turner et al., 1990: 161)

After European contact, many native plant resources also became significant items of trade to Europeans, who did not have the knowledge of the local environment and/or the time to collect locally available subsistence items. For example, early explorers in what is now Washington relied heavily on supplies of wapato acquired from local peoples (see accounts cited in Darby, 1996). Some of these native plant resources were new items of trade for the local peoples. For example, Captain Cook and his men required "grass" (species unknown) to feed the goats and sheep on their ships. Grass was not traditionally traded, but when the local people noticed the men's interest in it they began to charge for it (Turner, 1978). Similarly, it appears that

wild onions were not much used by Nuu-Chah-Nulth people, but they were harvested and sold to non-Natives on visiting ships when the demand for them was discovered (ibid.). More recently, some Ditidaht, and probably other people, harvested cascara bark (*Rhamnus purshiana*) to sell to drug companies; in the 1930s and 1940s it sold for about 20 cents per pound (Turner et al., 1983). Elsie Claxton (Straits Salish, personal communication to NT, January 1997) recalled that edible seaweed was routinely gathered by her family and other Saanich families and sold to Chinese buyers around the Gulf Islands (see also Williams, 1979).

Access to Products of Specialized Skills

Another advantage of trade was that it extended the benefits of some groups' expertise with certain technologies. That is, a finished product could be a highly valued trade item, even if the raw material for making it were common among groups. Examples of such products include red-cedar root baskets from Spuzzum (Lower Nlaka'pamux) and Pemberton (Lower Stl'atl'imx); yellow-cedar/mountain-goat wool Chilkat blankets; Haida red-cedar kerfed boxes and canoes; Nuu-Chah-Nulth canoes; and Nuu-Chah-Nulth and Kwakwaka'wakw yellow-cedar bark robes. Such products were widely renowned for their quality and/or artistic merit, and often found their way far from their origins.

In addition, such skills could be important within a group. Teit (1900) noted that not all Upper Nlaka'pamux peoples made dugout canoes from ponderosa pine or cottonwood, and those specialists who did traded them to others in the group. This type of skill specialization could operate on an even more individualistic level. For example, according to Annie York (Turner et al., 1990), some women at Spuzzum traded baskets and mats for buckskins, salmon and other products of hunting and fishing, especially if a woman were a widow with no husband to provide these things for her.

After European contact, finished products such as baskets and carvings were frequently sold to non-Native immigrants, traders or tourists, providing a source of income for some of the many people whose traditional means of subsistence had been disrupted. Margaret Lester (Stl'atl'imx) remembered that her grandmother used to take her baskets to farms in the Pemberton Valley to exchange for clothing, potatoes, fat, beef or "anything we could get" (Turner et al., 1987).[10] Within the last century many Indigenous women have supported their families almost entirely by selling baskets to non-Natives, often for very little remuneration (ibid.; Turner, 1996).

Overcoming "Scheduling Conflicts"

A final benefit of trade was one that operated within groups. There were inevitable trade-offs in terms of time spent on various harvesting and processing activities and trade allowed people to specialize temporally and share the fruits of their labours. For example, Turner (1992) notes, for the Stl'atl'imx, that those families who spent more time fishing could exchange extra fish for berries from those who spent extra time berry picking on the mountain slopes. Of course, for some activities there would be advantages to having as many people as possible accumulating a given resource, but it seems likely that in at least some situations a division of labour was advantageous. Indeed, the traditional division of labour into male hunters and female gatherers is one manifestation of this principle.

Exchange of Technologies and Knowledge

In addition to trade of physical goods, there was significant interchange of intangible plant-related resources, such as a specific basketry technique, knowledge of how to use a certain plant medicinally or a story regarding a plant's place in traditional history.[11] Unfortunately, determining with certainty whether such similarities among cultures originated through exchange is problematic, because there are at least three distinct ways in which commonalities among groups can develop:

(1) Transfer of information from one group to another, through connections of trade, intermarriage, slaves or other relationships. This possibility is, of course, the phenomenon of interest for the present study.

(2) Common origins of the knowledge from a common ancestral group. Thus, for example, desert parsley (*Lomatium macrocarpum*) was important to the Nlaka'pamux, Stl'atl'imx and Secwepemc, and has similar names and similar presence in the traditional narratives of these closely related Interior Salish groups (Turner et al., 1990). It is difficult, or perhaps impossible, to determine whether these similarities reflect the common proto-Interior-Salishan origins of these groups, or whether knowledge of the plant was transferred from one to the others at some point after the groups diverged. Turner, Ignace and Compton (1997) note that interaction through trade or marriage among the Interior Salish groups was frequent, and thus the general similarity of these cultures is likely the result of both common origins and subsequent interaction.

(3) Convergence due to similarities in the environment or in plant characteristics. For example, a semi-subterranean winter dwelling is common to many groups

who live under continental climate regimes, because, as may have been independently discovered many times, such a dwelling is an effective way to provide shelter from severe winter temperatures and winds. Similarly, summer shelters with wood frames and rush matting are also common to many of the world's peoples. Alternatively, many different groups may use a particular wood, such as vine maple or western yew, for carved items and implements because the properties of the wood that make it favourable for this purpose become evident to many groups independently. Properties of medicinal plants may also be independently empirically determined; possible examples are scouring rush (*Equisetum hiemale*) and pipsissewa (*Chimaphila umbellata*), which were used as gynecological aids in childbirth by groups as disparate as the Menominee of the Great Lakes area and the Nlaka'pamux of present-day British Columbia (ibid.). Even stories may evolve convergently; for example, intelligent and scavanging animals such as a coyotes or ravens would be likely candidates for a "Trickster" type of character in any culture.

One illustration of some of the difficulties in distinguishing between these possibilities is found in the work of Teit. He lists numerous examples of similarities in technology among various interior groups: "nearly all the kinds of fish-traps used by the Carrier and Shuswap [Secwepemc] were also utilized by the Chilcotin [Tsilhqot'in]. Fish-spears . . . had two or three prongs, like those commonly used by the Shuswap . . ." (Teit, 1909: 779); "Roots are dug and cooked [by the Tsilhqot'in] in the same manner as among the Shuswap. . . . The principal fruits gathered were service-berries [saskatoons] and soap-berries, both of which were cured in the same manner as among the Shuswap" (ibid.: 780). The "common origins" explanation is possible, but perhaps unlikely in these examples, because the Carrier and Tsilhqot'in are Athapaskan peoples while the Secwepemc are Salishan. Independent convergence is also possible, but unlikely since the groups are physically close together and probably communicated frequently, and the techniques noted are relatively specialized. However, even if exchange is established as the definite reason for these similarities, the direction of exchange is not clear,[12] without additional evidence suggesting that one group borrowed the technology from another.

One type of such additional evidence (i.e., linguistic evidence) is discussed in the next section. There are also other lines of evidence to suggest transfer and directionality. In some cases, oral traditions have preserved this information. For example, according to Decosse (1980), oral traditions of the Tlingit and Athapaskan peoples state that the latter obtained from the former technological knowledge for construction of fish weirs and other tools, which greatly improved the latter's living standards.

In other cases, directionality can be inferred from the refinement of the technology itself. A technology may have been highly developed by one group, and imperfectly imitated by others. For example, the Nuxalk learned from the Carrier and Tsilhqot'in how to make birch-bark baskets and canoes, but they never became as skilled as their teachers (Turner, 1979; Compton, 1993). Some ethnologists suggest that the technique of making twined baskets was learned by the Coast Salish from the Kwakwa̲ka̲'wakw and Nuu-Chah-Nulth; originally the Salish on the Coast were thought to have made only coiled baskets like their Interior Salish relatives (Turner, 1979).

Perhaps the most easily interpreted situations are those that have occurred relatively recently, so that the information is clearly in a state of early diffusion. For example, Annie York (Turner et al., 1990) had a tremendous understanding of Halq'emeylem botany, perhaps almost as much as she had about her own people's (Nlaka'pamux) plant uses. Her knowledge included detailed information about Halq'emeylem foods and medicines, as well as some information regarding medicines of the Okanagan and even "Alberta Indians." Perhaps current similarities in some technologies among groups began in a similar fashion, with certain individuals of Group A becoming well acquainted with Group B's knowledge (perhaps as a result of living near them) and that knowledge would then gradually diffuse throughout Group A.

Undoubtedly, as with direct trading of goods, the amount of such interchange rose substantially after contact, due first to the influence of the fur trade. The effect was sometimes dramatic. Albright (1984: 16) noted, "Intensified trading activities between the Tlingit and Tahltan brought about increased intermarriage between the two groups, the use of Tlingit as the language of trade and the adoption of many aspects of Tlingit social customs and organization including displays of wealth and status." More recently, the greater mobility of Indigenous peoples for work and other reasons[13] also led to increased exchange. Many Indigenous people in British Columbia, particularly those living in the vicinity of the lower mainland, worked as crop harvesters in the Fraser Valley and in the Tacoma and Yakima areas of Washington. People from various cultural groups met in this way and exchanged botanical and other types of information, about basketry (Turner and Efrat, 1982),

new foods like soapberry "lemonade," and even new medicines, such as the use of oceanspray fruits for diarrhoea (Elsie Claxton, Straits Salish and Violet Williams, Halq'emeylem, personal communication to NT, 1991). This situation is certainly continuing today among contemporary basketweavers, such as members of the California Indian Basketweavers' Association, who routinely share specialized knowledge about materials and techniques.

Much exchange of plant knowledge also took place between Indigenous and non-Indigenous people. In the case of Indigenous peoples learning from newcomers, the information concerned either introduced species or native species. For example, the Nlaka'pamux, and no doubt other peoples, learned to cook the introduced dandelion (*Taraxacum officinale*) as greens, to make wine from dandelion flower heads and to use the cooked taproots medicinally for jaundice and liver problems and the latex to eliminate warts (Turner et al., 1990). Also, after Japanese people living on the coast began to salt and pickle stipes of the native bull kelp (*Nereocystis luetkeana*), this practice became common among some coastal Indigenous peoples (Compton, 1993). For newcomers learning from Indigenous peoples, the transfer of knowledge about native plant resources was at times critically important. For example, David Douglas (1914: 63, 171) recorded during his travels in present-day Washington that a man named Jacques Finlay and his family were subsisting on "... a sort of cake made of *Lichen jubatum*, Linn. [*Bryoria fremontii*, black tree lichen], and a few roots of *Scilla esculenta* [*Camassia quamash*, camas] and of *Lewisia rediviva* [bitterroot]." Douglas also described the special preparation techniques used for the camas and lichen, including pit-cooking. These practices, undoubtedly learned from the local Indigenous people, were critical in releasing the nutrients of these foods (Kuhnlein and Turner, 1991).

Linguistic Implications

Clearly, trade necessitated and resulted from communication among groups, and at least partial multilingualism was probably common. However, people not only learned other languages, but also adopted elements of those languages, both words and translations, into their native tongue (e.g., Gunther, 1945).[14] Plant-related elements were part of the interchange, which could be extensive. For example, Nuxalk, a Salishan language, has more botanical terms in common with its neighbouring North Wakashan languages than with other Salishan languages, and at least some of these borrowings may be attributed to trade or some other type of cultural relations (Turner, 1973). Similarly, Gottesfeld (1994) lists eight plants or plant parts (fireweed [*Epilobium angustifolium*], spreading dogbane [*Apocynum androsaefolium*], cedar, cedar bark, pine cambium, yellow pond lily [*Nuphar polysepalum*], bog cranberry and wild pin cherry [*Prunus pensylvanica*]) whose names are shared between the Gitksan (Tsimshian language family) and Wet'suwet'en (Athapaskan) languages, and suggests that several of these (the first four or five in the list) are Gitksan in origin.

In some cases, deciphering the origins of similarities among languages is problematic for the same reasons described in the previous section. For example, some words may reflect ancient roots in the ancestral language of closely related groups. Silverweed may be a case in point; its name is a variant of *xilxel* in a number of Interior Salish languages. Alternatively, different words may have the same meaning in different languages not because of a translation borrowing, but because there is a convergence, or some inherent similarity that suggests the meaning. For example, the name for *Empetrum nigrum* translates as "crowberry" in a number of languages, probably because the berries are black and crows eat them, and various names for puffball mushrooms (*Lycoperdon, Calvatia* and *Bovista* spp.) relate to ghosts, corpses or other supernatural phenomena (Burk and Fitzgerald, 1981), perhaps because of the fungus' ethereal appearance.

The complexities in linguistic analysis are well illustrated by an example discussed by Compton (1993). The (Wakashan) Hanaksiala and Haisla have a Salishan name for kinnikinnick berries, which may have been obtained through trade with the (Salishan) Nuxalk. However, Compton feels it is more likely that the name reflects the cultural origins of the Hanaksiala/Haisla among the Oweekeno, who were known to obtain the plant through trade with the Nuxalk, and who have a Nuxalk name for it.

In spite of the complexities, however, linguistic analysis of plant terms can often give interesting and important insights into the existence and directionality of exchange. To illustrate, the Nuxalk use Wakashan names for edible seaweed and giant kelp, species which do not occur in Nuxalk territory and thus were probably acquired by trade (Compton, 1993). Also, it is known that the Nlaka'pamux obtained camas by trade, but such trade could have taken place with peoples from the British Columbia coast, or from the interior of Washington, or both. Trade with Washington peoples is more likely, at least as the original and/or more important source, since at least one of the names for camas is linguistically related to those in other Interior Salish languages (Turner

and Kuhnlein, 1983; Turner et al., 1990). Similarly, the Oweekeno probably obtained camas through a Kwakwaka'wakw intermediary rather than directly from the Coast Salish, since the Oowekyala name is cognate with the Kwak'wala name but not with the Salishan name (Compton 1993).

Linguistic patterns also help elucidate transfers of knowledge. The name used by Ditidaht people for cottonwood is not analyzable in the Ditidaht language, but is analyzable in Hesquiaht. Like the Hesquiaht, the Ditidaht make a salve of cottonwood buds in deer fat, and it is likely that if the name was transferred from the Hesquiaht to the Ditidaht, the use was as well (Turner et al., 1983). Another interesting situation involves the Hanaksiala/Haisla use of edible seaweed (Compton 1993). Not only is the name for this species said to come from the Coast Tsimshian, but a Tsimshian story concerning knowledge of its use was given to one consultant by his grandfather, who translated the story from Tsimshian into Hanaksiala. Compton believes that this information suggests a Tsimshianic origin of edible seaweed use among the Hanaksiala. Compton (1993) provides a number of important insights into the transference of plant names between various North Wakashan and neighbouring groups.

A variation on this theme was described by Hess (n.d.). Sometimes, if the speakers of one language excel in a particular technique or craft, their neighbours may borrow their words relating to that activity or artifact. For example, the Straits Salish are exceptional reef-netters, and their name for that activity is derived from the name for willow, because these branches are used to anchor the nets. The Northern Lushootseed, whose territory is adjacent to the Straits', have a name for willow which is very similar to the Straits name. However, the Southern Lushootseed name for willow is completely different. This example also illustrates the importance of borders in demonstrating clear instances of diffusion. Turner et al. (1987) note that there are communities on the Stl'atl'imx/Secwepemc, Stl'atl'imx/Nlaka'pamux, Nlaka'pamux/Okanagan and Stl'atl'imx/Halq'emeylem borders that are functionally bilingual, and plant names and ethnobotanical traditions in the communities reflect these mixtures.

Finally, linguistic analysis of plant names can suggest broad patterns of past movement and interchange among different cultural groups. In a preliminary analysis of one Wakashan language (Ditidaht) and two Salishan languages (Straits and Lushootseed), Hess (n.d.) found that a number of plant names were borrowed by the Ditidaht from the Salish peoples.[15] Hess suggests that if this pattern is found to hold for the majority of borrowed plant names, it may indicate the possibility of Ditidaht expansion at the expense of Salish territory, assuming a relatively stable distribution of the plants in question.

A complex situation was also identified in a comparative study of Interior Salishan tree names (Turner, Ignace and Compton, 1997). Even though the Secwepemc language is most closely related linguistically to the Stl'atl'imx and Nlaka'pamux languages, fewer tree names are cognate among these three languages than among Secwepemc, Okanagan, Flathead, Moses-Columbian and Coeur d'Alene. This fact may give insight into the pattern of movements of these groups away from the proto-Salishan homeland, as the Secwepemc and the four southeastern Salish groups all, over hundreds or thousands of years, had to traverse the Interior Dry Belt, where certain tree species such as western red cedar were absent. However, some trees have names shared among Secwepemc, Nlaka'pamux and Stl'atl'imx, while those of other trees with similar distributions are not. Turner, Ignace and Compton (1997) conclude that trade networks were probably involved in the development of these linguistic anomalies.

Ecological Implications of Plant Exchange

Clearly the presence and abundance of plant resources available in each Indigenous group's territory affected which resources were used or exchanged and in what quantities. However, the converse of this statement—to what extent did Indigenous peoples influence the distribution and abundance of native plant species?—has too infrequently been considered in the anthropological and biological literature. Likely, people did accidentally and/or intentionally disperse plants to new locations and consequently increased their range, or increased the number of locations occupied by a plant species in a given area (i.e., increases in frequency/abundance). There are volumes of evidence regarding such impacts, both deliberate and accidental, by Europeans (e.g., Crosby, 1986) and the effects of non-human animal dispersers are similarly well considered. However, there has been a tendency to view pre-contact worlds as "pristine wilderness" untouched by human hands (Blackburn and Anderson, 1993; Denevan, 1992), which may help explain the limited attention paid to Indigenous peoples' impacts on plant populations.

While a few studies have suggested instances of pre-contact human plant dispersal in eastern North America (cf. Black, 1994; Day, 1953; Gilmore, 1931), few comparable reports have been made in the northwest. A notable exception is a work by Wilson et al. (1988) regarding bitterroot. This important root vegetable and item of exchange was until recently thought to be restricted in its

Canadian distribution to British Columbia. However, disjunct populations were discovered in western Alberta in 1985, and were initially attributed to wind dispersal (Kuijt and Michener, 1985, cited by Wilson et al., 1988). Wilson et al. suggest three other reasonable hypotheses: relictual distribution, which developed as a result of climate change; intentional cultural dispersal by transplanting, since Indigenous groups in the area showed a familiarity with cultivation of other species such as tobacco; and accidental dispersal of the seeds or roots of bitterroot by groups (such as the Ktunaxa) who regularly crossed the continental divide. The authors suggest other species with disjunct distributions that could be similarly explained, including blue camas, yellow angelica (*Angelica dawsonii*), Oregon-grape (*Berberis aquifolium* ssp. *repens*) and western sweet cicely (*Osmorhiza occidentalis*). While the authors do not support conclusively any of the three hypotheses, their conclusions in terms of the potential importance of cultural dispersal are significant:

> Localized, disjunct occurrences of plants that were economically important [for] native groups therefore cannot be assessed fully without consideration of the possibility of cultural dispersal. Adventitious plantings of such species beyond their normal range would make economic sense in providing local supplies to supplement or even supplant long-distance trade, and to provide "wayside stops" along seasonal migration routes. Native use and trade would also have resulted in occasional accidental plantings. Such considerations are of extreme importance to archaeologists and phytogeographers because of the low level of visibility of plant-gathering cultural systems in the archaeological record. (Wilson et al., 1988: 518)

The disjunctions noted in Wilson et al.'s work, along with those described from the east, are generally small populations, which may imply that the ecological impacts of such dispersal are generally minor. However, the fact that such disjunctions are isolated, and located near areas of human habitation or migration, is what makes human influence a recognizable possibility (Black, 1994). Other, more extensive, populations may have begun initially as similar small disjunctions. This is speculation, but the potential exists for significant impacts on the ranges of species. Also, if a subpopulation becomes well established, with the disjunction maintained, the possibility of genetic differentiation is high.

In some cases the effect may not be so obvious. As noted by Black (ibid.), people can increase the abundance of a species within or adjacent to its natural distribution. Also, people may encourage the growth of plants that have been dispersed by more usual means. Black gives the example of a wild strawberry patch tended by a Cree man in an otherwise unfavourable boreal habitat. The plant could have been established originally by means of a bird, but the man provided it with a favourable place to grow and thrive. The existence of an unusual low-elevation population of yellow avalanche lily near Neskonlith Lake in southcentral British Columbia may be another example. This species is more commonly found at subalpine elevations in BC. It is possible that bulbs or seeds were accidentally brought by animals or humans or purposefully brought by people to the more easily accessible Neskonlith meadows long ago, and that the practices of regular digging, burning and cultivation[16] in the area over time encouraged the remarkable abundant growth evident there today.

The ethnographic and ethnobotanical literature provide examples of species that were said to have been transplanted, and particular locations where this occurred. Some transplantations involved traded species, which were thus brought in from another group's territory, whereas others involved economically important local species that were simply transplanted closer to villages. In both cases, the desire for a convenient source of an important resource was probably a prime motivation. A possible example is camas, a bulb generally acquired by the Nuu-Chah-Nulth through trade from the Salishan peoples of southern Vancouver Island, but which according to Hesquiaht people was introduced and planted around Hesquiaht village about 100 years ago. Cat-tails, too, were said to have been transplanted into Hesquiaht territory (Turner and Efrat, 1982). Springbank clover was reportedly established at a site in the Kitlope Valley (Hanaksiala territory) by a Nuxalk woman, Margaret Siwallace (Chief Ken Hall, Haisla relative of Margaret Siwallace, personal communication to NT, 1994). Also, one ethnographic account suggests that peoples of the Puget Sound region transplanted wapato, an important root vegetable, from one area to another (Haeberlin and Gunther, 1930). Meilleur (1979) speculated on a means by which a species of tobacco (*Nicotiana quadrivalvis*, a different species from that grown and used in southern British Columbia, *N. attenuata*) came to be cultivated by Haida and Tlingit peoples some 1 600 km north of the species' normal range. He suggests that the plant was initially cultivated and traded along an east-west corridor in the vicinity of The Dalles on the Columbia River, then was carried up along the eastern border of the Rockies and over to Athapaskan or Gitksan territories, which were served by Tlingit trading parties.

Transplantations of stinging nettle, an important fibre plant commonly found associated with areas of human habitation (Turner, 1978),[17] provide examples of both intra- and intergroup exchange. Compton's (1993) consultant Gordon Robertson stated that the Hanaksiala and Haisla people planted stinging nettle around their villages so that it would always be at hand for making twine. Compton (1993: 295) notes further that people visiting from the central coast communities of Kimsquit, Bella Coola and Metlakatla "when they came to trade for food items with the Hanaksiala, took stinging nettles back with them."

These types of transplants may have become much more common following the influence of European horticultural techniques.[18] It may be possible, with long-lived species, to date individual plants or populations thought to have been deliberately transplanted. However, in general it is difficult to determine with any certainty the extent of pre-contact human impacts on the distribution and abundance of plant species. Oral traditions may not retain such incidents over countless generations. Also, because the most basic biology of many plant species is still poorly understood, there is often no basis for pursuing such higher-level questions as how a species got to be where it is (Dr. Geraldine Allen, plant taxonomist, University of Victoria, personal communication to DL, 1996). Nevertheless, the examples of possible types of translocations discussed should be sufficient to encourage greater consideration of potential past human impacts on plant ecology. This is particularly true in cases where the species' range appears anomalous in some way, as in cases of disjunctions. As Gordon Day (1953: 343) commented, "a knowledge of local archaeology and history should be a part of the ecologist's equipment." The reverse is, of course, true for anthropologists.

Recent Indigenous Plant Exchange

Contact with Europeans and other non-Natives brought an increased frequency and intensity of exchange, including traditional plant resources and knowledge. This increase probably reached its peak around the beginning of the 20th century (Turner and Efrat, 1982). With an ever-greater reliance by Indigenous peoples on introduced foods, materials and medicines, and an increasing dominance of European language, currency and other aspects of culture, many types of traditional plant-related exchange dwindled.

However, a number of traditional plant resources continued to be valued exchange items despite the general decline in native plant use and trade. For example, Ida Jones recalled that when she was young, Ditidaht people used to trade dried fish and other items for camas from the Salish people in Victoria (Turner et al., 1983). Many traditionally valued resources were also bought with money rather than other subsistence items. Elsie Claxton, Straits Salish from Tsawout, noted that West Coast (Nuu-Chah-Nulth) peoples really liked camas bulbs, and that, "a long time ago," they would pay five to ten dollars for a 50-pound potato sack of the cooked bulbs (personal communication to NT, October 1996). The same quantity of potatoes would have cost perhaps two dollars at that time. Also, Annie York and Alice Paul remembered that, in the early 1900s, Nlaka'pamux women used to sell soapberries and other traditional foods at the camps of Native hop pickers in the Fraser Valley (Turner and Efrat, 1982; Turner et al., 1990).

More recently, Compton (1993) noted that along the coast in 1989, a pint jar of soapberries was worth $25 CDN and a quart jar $50 CDN. Also, according to Turner and Efrat (1982), bear-grass leaves were still being purchased by Hesquiaht basketmakers from people in Washington, for about $1.00 per 2.5 cm (1 inch) bundle.[19] Many goods are now exchanged privately among friends and relatives from different areas; for example, Mary Thomas, who is Secwepemc, obtains bitterroot from friends in Okanagan territory (personal communication to NT, 1995, 1996). She also described an example of "sharing of access" to resources that has occurred in her lifetime. Her uncle was married to a Ktunaxa woman, and they and some other Ktunaxa people would travel to Salmon Arm, in Secwepemc territory, by train during the summer. They would stay about a month and harvest "everything that the Secwepemc people used," including berries, root vegetables and salmon. In return, they brought dried elk meat, which their Secwepemc friends were not able to acquire locally.

Transplanting and transporting of plants and plant propagules from one place to another is also a common practice today. For example, Kwakwa̲ka̲'wakw Hereditary Chief Adam Dick (personal communication to NT, 1996) recalled transplanting rooted stems of highbush cranberry from the bog meadows at Kingcome Inlet to his own backyard, to provide a good source of berries for his family's use. Secwepemc plant specialist Mary Thomas has transplanted a number of important wild root vegetables, including the living bitterroot brought by friends, into her own garden. Recently, at a Nuxalk potlatch in Bella Coola, visiting Heiltsuk chiefs were presented with live cottonwood trees as gifts. These were planted in Bella Bella, and are growing vigourously there today (Evelyn Windsor, Heiltsuk, personal communication to NT, 1996).

As these last examples imply, social aspects of Indigenous exchange have remained strong. For example, a recent report focussing on the Carrier people noted that, despite considerable post-contact cultural change, many fundamental patterns of traditional culture persist, such as traditional methods of redistribution by reciprocal giving, and sharing to ensure that everyone has food to eat. The report concluded that participation in this exchange system, in which kinship ties were still the basis of association, confirmed a person's rightful place in the community (Archeo Tech Associates, 1993).

Plant-related exchange with non-Natives also continues today. Indigenous artisans continue to sell their baskets, carvings (especially masks and totem poles) and other crafts as artwork, and prices now more accurately reflect the skill and effort involved. Exchange of knowledge takes place as well. Ethnobotanists continue to learn about traditional uses of plants, and are also paying greater attention to traditional methods of landscape and resource management. There are also non-Native individuals who seek traditional knowledge as a means of exploiting potential profits generated, for example, by medicinal plants. Fortunately, there is an increasing awareness that the intellectual property rights of Indigenous peoples need to be respected, and acceptable forms of compensation developed. More realistic arrangements for reimbursing people for their knowledge, as well as for their time and the botanical goods they produce are essential.

Conclusions

The exchange of plant materials, including foodstuffs, materials and manufactured products, was an important facet of complex exchange networks encompassing many northwestern Indigenous peoples. Trade was important in increasing the diversity of foods and materials available to people, in obtaining products of higher quality than would be available locally, in exchanging items of specialized crafting, or in overcoming scheduling conflicts. Furthermore, plant exchange was not only influenced by the broader cultural context, but in turn affected that context through impacts on a group's language and collective knowledge. These economic and other cultural implications of plant exchange continued to exist after contact, and are still apparent to some extent today. Finally, plant exchange may have had significant extra-cultural consequences, in terms of effects on the ecology of the plants themselves, including both abundance and distribution.

Analysis of the development of various botanical technologies and linguistic anomalies can reveal much about the origins and interrelationships of the peoples themselves. Yet many questions remain, such as: "Why were some resources/technologies/names exchanged, but not others?"; "What influences did traditional patterns of use and ownership play in plant abundance and distribution?"; and "To what extent was trading a social or an economic phenomenon, and was it desired, or required, for peoples' survival and well-being?" While many mysteries will undoubtedly persist, rewards for investigating such questions are equally certain.

Appendix 1: Current and Previously Used Names for Aboriginal Groups Discussed in Text (Not a Complete Listing)

Contemporary Name	Previously Used or Alternate Name/s
Ditidaht	Nitinaht
Gitksan	Gitxsan, Gitk'san
Halq'emeylem	Halkomelem, Cowichan, Sto:lo, or Stalo (includes Katzie)
Heiltsuk	Bella Bella, Northern Kwakiutl
Kitasoo	Southern Tsimshian
Ktunaxa	Kootenay (or Kootenai or Kutenai)
Kwakwa̲ka̲'wakw	Kwakiutl, Southern Kwakiutl, Kwagiulth
Lushootseed	Puget Sound Salish, including Duwamish, Green River, Lower Skagit (Swinomish), Nisqually (Skokomish), Puyallup, Skykomish, Snohomish, Snuqualmie, Squaxin, Suquamish, Upper Skagit
Nisga'a	Nishga, Niska, Nisga
Nlaka'pamux	Thompson
Nuu-Chah-Nulth	Nootka, Westcoast (sometimes includes Ditidaht)
Nuxalk (-mc)	Bella Coola
Secwepemc	Shuswap
Stl'atl'imx	Lillooet
Straits Salish	includes Lummi, Samish, Clallam or Klallam, Saanich, Songish
Taidnapam (Sahaptin)	Upper Cowlitz
Tsilhqot'in	Chilcotin
Twana	Skokomish

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Notes

1 Malinowski (1922) described this effectively for Melanesian peoples. In the Pacific Northwest, the practice of potlatching provides an example of equally complex exchange.

2 Names used in the text are those thought to be currently preferred by the various Indigenous groups themselves. A list of commonly used synonyms is found in Appendix 1, and a map of the groups in the region of interest is shown in Figure 1.

3 For example, Teit (1909) stated that the Tsilhqot'in traditionally traded little with the Carrier, but that this changed after the establishment of trading-posts in Carrier country in the early 19th century.

4 Scientific names for plant species are given in Table 1, unless otherwise noted.

5 Gunther (1945) stated that except for choice varieties of dried salmon, there was no food item more widely traded by Washington peoples than camas. The importance of camas was also noted by Ronan (1932: 301), who noted "that when the Flatheads went to trade with the Blackfeet they could get more in exchange for a few bags of camas than for anything else: [and] that they often got a buffalo robe for a few handsful of it."

6 *Ligusticum canbyi* has a scattered and infrequent distribution in relatively inaccessible habitats, therefore it is perhaps not surprising that it could have been an item of trade.

7 Part of this trail system was travelled by Alexander Mackenzie, which resulted in its being designated the "Alexander Mackenzie Heritage Trail." While this designation in some sense recognizes the importance of the trail, or one part of it, Birchwater et al. (1993) point out that it does not acknowledge the venerable history and significance of the trail system for the Nuxalk-Carrier peoples.

8 The potato trade was highly significant to the Europeans as well. Mackie (1984) notes that colonists in the Victoria area in the mid-1800s acquired most of their two staples, potatoes and salmon, from Indigenous peoples such as the Cowichan.

9 It is also possible that Indian hemp was a common item of trade simply because it was constantly in demand. Teit and Boas (1973: 255) stated: "Indian hemp, Indian-hemp twine, and dressed skins, chiefly deerskins, were staples, and although almost equally common to all the tribes of the interior, were in demand almost constantly because they were so much required for manufactures and clothing. All commodities could be bought with them."

10 Teit (1906: 207) similarly noted of the Stl'atl'imx that "At the present day coiled [cedar-root] baskets are manufactured in great numbers by the Lillooet River and Pemberton bands, who sell them to the whites and to the Indian tribes of the coast. . . ."

11 The work of Claude Lévi-Strauss (1966, 1969) is notable in demonstrating the complex linkages, borrowings and conversions that occur among the stories and traditions of different peoples.

12 Teit appears to imply that, for example, fish prongs were modeled by the Tsilhqot'in after Secwepemc design. However, in most instances Teit probably means his comparisons simply as a shorthand, to avoid reiterating descriptions he has already made in detail for other groups, and directionality of transfer, or transfer per se, is not implied.

13 These "other reasons" included, ironically, participating in non-Native cultural activities. For example, Sliammon (Comox Salish) women from around Powell River credit Secwepemc women of Kamloops for teaching them the art of making coiled cedar-root baskets, as a result of interactions at prayer meetings in Kamloops around the turn of the century (Kennedy and Bouchard, 1983).

14 In the period of intensified trade after contact, the necessity for communication among many different groups including non-Natives led to the development of Chinook jargon. A number of Chinook jargon terms became so widely used that the original names in many languages were forgotten (Turner and Kuhnlein, 1983).

15 It is interesting that the opposite pattern was noted previously for groups of these language families further north; i.e., the Salishan Nuxalk language borrowed extensively from the North Wakashan languages. For example, the name for licorice fern in various Coast Salish languages, variants on the Halq'emeylem name *tl'eśtip*, is apparently derived from the Ditidaht, *tl'aa7asiip*, since it is analyzable in the latter language, as "tendency to grow on the ground" (Turner et al., 1983).

16 See Turner (1992) for a discussion of potential positive impacts of Indigenous harvesting and management practices on plant populations.

17 Stinging nettle also simply could have been encouraged where it grew, as it has a weedy tendency which would make it likely to thrive in disturbed areas.

18 The phenomenally rapid and widespread acceptance of the potato suggests that Indigenous peoples mastered gardening techniques with impressive alacrity, and/or they were previously familiar with analogous techniques. Thus, "gardening" types of activities may have been more common in pre-contact times than is generally assumed (Suttles, 1951b).

19 However, it is felt that this "grass" is not as long or as good quality as formerly (Turner and Efrat, 1982).

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