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THE POTLATCH AS FRACTIONAL RESERVE BANKING

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Abstract

Despite often-abundant natural resources, so-called “Indian Country” suffers the worst systemic poverty in North America today. Much of the economic story of Indian Country is one of hopelessly limited property rights naively designed to protect its wards. Whether encumbrances on fee simple ownership, restrictions on minerals development, access limitations to traditional hunting and fishing resources, the absence of taxing authority, or limitations on access to commercial markets, poorly defined property rights are a critical stumbling block to tribal economic development. Restoring a working system of property rights is essential to unlocking the wealth of Indian nations, and doing that calls for better understanding of their property rights institutions prior to European contact. This chapter focuses on the Northwest Coast Tribes’ early capital markets and specifically on how their potlatch system served as a system of fractional reserve banking to expand their money supply and finance wealth enhancing investments.

THE POTLATCH AS FRACTIONAL RESERVE BANKING

D. Bruce Johnsen *

. . . they saddled [First Nations] with a property-rights system that prevented trade and created a 100-year credit crisis from which we have yet to recover. Manny Jules¹

When we think of North American Indians, we might reflect on the reservation system in the U.S. and the reserve system in Canada, so-called “Indian Country.” Despite often-abundant natural resources, Indian Country suffers the worst systemic poverty in North America today. As desultory as it is demoralizing, much of the economic story of Indian Country is one of hopelessly limited property rights naively designed to protect its wards. Whether encumbrances on fee simple ownership, restrictions on minerals development, access limitations to traditional hunting and fishing resources, the absence of taxing authority, or limitations on access to commercial markets, poorly defined property rights appear to be a critical stumbling block to tribal economic development. Restoring a working system of property rights is essential to unlocking the wealth of Indian nations, and doing that calls for better understanding of their property rights institutions prior to European contact. This chapter focuses on their early capital markets.

Manny Jules’ claim that poorly defined property rights have created a long-lasting credit crisis among Canadian tribes (now known as First Nations) is difficult to deny based on a rudimentary understanding of property rights economics. Beginning in the mid-1800s, the British Crown began to squeeze British Columbia tribes into the Canadian Indian reserve system. Over the ensuing decades, various individuals and tribes

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¹ Quoted in Flanagan, Alcantara, and Le Dressay (2010) x.

established the right to occupy reserve lands, but whatever rights they had were held in common or by custom and with no rights of alienation except to the Crown.² Among other things, the resulting patchwork of individual and tribal rights to land has shown itself almost completely inadequate to allow tribal members to borrow to finance investment in basic capital improvements. The inability to hypothecate land—now their main source of wealth—for the protection of lenders’ contractual rights is, at least in part, the likely source of the credit crisis Jules describes (see Haddock and Miller 2006).

Jules’ observation may be only the tip of a much larger credit-crisis iceberg. Previous work on the Pacific Northwest Coast (NWC) tribes of the U.S. and Canada argues that, prior to contact, they relied on an institution known as the potlatch—a form of reciprocal exchange—to enforce exclusive tribal property rights to identified territories and their natural resources (Johnsen 1986, 2001, 2006, 2007, 2009). Most important among these resources were and are the salmon stocks that spend most of their lives in the sea but spawn in the many fresh water rivers, streams, and lakes along the coast. With secure property rights it is very likely the tribes actively husbanded their stocks.

Potlatching surely served in part as a system of credit, and this chapter examines whether it also functioned as an informal system of fractional reserve banking. With fractional reserve, the tribes would have been able to expand their money supply to finance wealth-enhancing capital investments, to which they had more than abundant access with the coming of trade.

Beginning in 1880 and continuing until roughly the mid-1920s, Canadian Indian authorities prohibited and actively suppressed the potlatch, with increasing sanctions over time. Though most tribes resisted the ban, it likely limited their access to credit for two reasons. First, the prohibition on potlatching hamstrung their customary method of enforcing exclusive tribal property rights, which might otherwise have limited the negative effects of the Crown’s reserve lands policy. Second, and to the point of the point made here, the prohibition undermined the tribes’ customary access to credit by way of potlatch gifts. If the potlatch was in fact a system of fractional reserve banking, the effect of suppressing it would have been to dramatically reduce the tribes’ money supply,

² Flanagan, Alcantara, and Le Dressay (2010) carefully recount the process by which First Nations reserves came to into existence and the various types of land tenure to which they have been and are now subject.

drying up credit, restricting capital investment, and reducing their common wealth—in a clamshell, their own great depression.

Lest all this seem fanciful, it is worth noting that my ongoing work on the NWC tribes dovetails nicely with compelling more recent work demonstrating that American Indians were far more populous, sophisticated, and prosperous prior to European contact than has always been assumed. Charles Mann (2005) powerfully makes this point in his work on pre-Columbian North and South America and its peoples. Purely by way of example, Mann reports on the emerging social science consensus that early American Indians genetically developed the small, inedible seed pods of an obscure plant into maize and eventually into corn. Other examples abound.

The first section of this chapter sets the scene by briefly describing the NWC and its peoples and the effect of European contact on their economy. It also describes roughly how potlatching worked and briefly recounts the assault leveled against it by Canadian Indian authorities. The second section illuminates the likely economic function of the potlatch as a mechanism to enforce exclusive tribal property rights. It then addresses the hypothesis that potlatching also functioned as an informal fractional reserve banking system. Though the evidence in support of this hypothesis is preliminary, casual, and thin, there is nothing in the historical record to refute it. The conclusion provides suggestions for how First Nations might move further toward prosperity in a culturally appropriate way of their choosing.

Northwest Coast Tribes and the Potlatch

It would be difficult to find a region and its peoples more populous, sophisticated, and prosperous than the Northwest coast (NWC) tribes. When Europeans first made recorded contact in the mid-to-late eighteenth century, the tribes proudly sought and achieved a notable accumulation of wealth. They inhabited the many islands, fjords, inland waters, and riverways of the rugged North Pacific Coast, from Yakutat Bay at the northern end of the Alaska panhandle to the Columbia River on the Washington-Oregon border (figure 1).

Although they had no central government, up and down the coast the chiefs of various tribes held recognized exclusive title to identified territories and their natural

resources. Most notable of their resources were the then-prolific stocks of Pacific salmon that used the rivers, streams, and lakes for spawning and as nurseries for the young. Several NWC rivers, most notably the Columbia and Fraser, originate hundreds of miles inland along the continental divide and are fed by innumerable tributaries. When Europeans arrived, most rivers and streams supported one or more species of Pacific salmon. The tribes harvested them during the late summer and early fall months as the salmon migrated upstream to spawn. When the fishing was done and the dreary NWC winters set in, the people had time for visiting, feasting, dancing, and potlatching.

The Tlingit, the Tsimshian, the Haida, the Gitskan, the Nisga'a, the Kwakiutl (now Kwakwaka'wakw), the Nootka (now Nuh-cha-nulth), the Coast Salish, and the Chinook tribes, though diverse in linguistic and genetic origins, all relied heavily on Pacific salmon as their primary source of food and wealth. Together with the interior plateau tribes along the upper Columbia and Fraser river basins, they represent what is known as the salmon culture.

The five species of Pacific salmon—Chinook, Chum, Coho, Pink, and Sockeye—differ in their biological traits, but they share three important characteristics. Most importantly, they are anadromous. Born in freshwater lakes or streams, they eventually make their way to the sea where they spend most of their adult lives. Between one and six years of age, depending on the species, they return to their natal stream as a cohort to spawn and complete their life cycle. The cohort, known as a run, is one among an unending series of cohorts that make up the stock of successive generations. A given river system might support multiple species and multiple stocks within a species.

Pacific salmon are also semelparous. Reproducing only once before dying, they are born in large numbers, grow quickly, suffer high mortality, live fairly short lives, and are extremely fecund. In-cohort competition throughout their life cycle is intense. This means Pacific salmon are extremely heritable. The time between generations is short enough, and the struggle to reproduce keen enough, that over the course of a human lifetime the biological characteristics of a given salmon stock can evolve dramatically in response to even minor changes in environment.³ Moreover, many of the unique physical

³ One study shows that reproductive isolation of the members of a common population can lead to biological speciation in as little as 55 years (Hendry, *et al.*, 2000).

characteristics of different populations are easily observed. As one naturalist reported in 1874, “[e]very river, every brook, every lake stamps a special character upon its salmon . . . which is at once recognized by those who deal in or consume them” (Marsh 1874, 108).

One nonobvious trait of most fish stocks, including Pacific salmon, is that, as harvesting effort increases from zero, the sustainable biological stock of fish initially increases, then levels off, then decreases. The ideal harvesting decision for a wealth maximizing owner involves optimizing over labor effort and the sustainable catch. Tribal chiefs were widely known to possess a *corpus* of secret knowledge about how best to manage their resources to create wealth.

During the prehistoric and early contact period the tribes were very warlike and possessive of their territories. In several cases they attacked and successfully destroyed trading vessels (Jewitt 2001) and even fortified European trading posts (Drucker 1950, 1965). They also fought among themselves over trade routes and valuable natural resources (Ferguson 1979). Wars were sometimes waged to annihilate an entire group to gain possession of its salmon streams and other resources, to seek revenge for prior wrongs, or simply to pillage, plunder, and take slaves (Drucker 1965).

With early European contact, tribal prosperity suffered a huge but ambiguous shock. On one hand, European diseases decimated the populace indiscriminately. Some have estimated population declines of 80 to 90 percent from a pre-contact high of roughly 150,000 (Donald 1997). Beginning in successive waves around 1770 and continuing through 1880, the tribes succumbed to smallpox, malaria, dysentery, influenza, measles, and possibly even leprosy (Boyd 1999). With the untimely death of their chiefs, much of the tribes’ secret knowledge may have been lost forever. On the other hand, dramatic population decline left a temporarily fixed, but ultimately dwindling stock of resources to a much smaller population base. Export prices and per capita wealth initially rose, and with it the frequency and intensity of potlatching also rose.

European contact brought further crosscurrents to NWC life. The tribes quickly adopted the Hudson’s Bay blanket as their medium of exchange. It is difficult to overestimate the informational benefits this must have generated via standardization (Alchian 1977). But, at the same time, what had been for the tribes a closed access

salmon fishery opened to access by others. English settlers brought with them the expectation, imbedded in the *Magna Carta*, that as against the Crown the public is free to fish in tidal waters and beyond absent legislation to the contrary (Harris 2001, 29-31). With the wholesale arrival of Europeans, primarily Scottish immigrants, the race to catch salmon under the law of capture was on. Canneries soon began to dot the coast to process, package, and export the yearly catch. Initially, the canneries relied on Indian river fishers for their salmon supply, but Europeans marine fishers soon displaced them. This was the origin of the current commercial ocean salmon fishery that has now failed so miserably under the law of capture, despite a byzantine system of licensing, license buy-backs, and gear restrictions (Higgs 1982).

The Potlatch and its Suppression

Codere (1959, 63) described potlatching as “the ostentatious and dramatic distribution of property by the holder of a fixed, ranked, and named social position to other position holders” with the expectation of return gifts at a later, unspecified time. Although there are many variations on the underlying theme, ranging from informal feasts to elaborate regional events, on its face potlatching redistributed wealth both within and between tribes. Any failure by a ranking titleholder to reciprocate or any shortfall in the amount of the return gift raised the potlatch rank and social prestige of the more generous party and lowered that of his rivals. The level of formality and the extent to which different tribes kept track of the balance of potlatch gift distributions probably varied across the culture area, but relative success in potlatching was the primary basis for social prestige throughout. As European contact increased, it appears the tribes expanded the formal potlatch system up and down the coast.

The origins of the potlatch are discernable from the historical record. The tribes’ oral histories routinely recount stories of their “potlatch law” (Cole and Chaikin 1990, 127), such as the following by way of example:

We used to fight with bows and arrows, with spears and guns. We robbed each others’ blood. But now we fight with this here (pointing at the copper which

he was holding in his hand), and if we have no coppers, we fight with canoes or blankets.

True is your word. . . . When I was young I have seen streams of blood shed in war. But since that time the white man came and stopped up that stream of blood with wealth. Now we are fighting with our wealth. This time of fighting has passed. The fool dancer represents the warriors but we do not fight now with weapons: we fight with property. (Codere 1950, 63)

The potlatch was ubiquitous across the salmon culture, and it appears to have been multilateral rather than strictly bilateral, at least at times. A representative potlatch consisted of a weeks-long winter ceremony arranged by a tribal chief acting as host of another tribe or tribes. Both hosts and guests danced for days or weeks, and the chief hosted lavish feasts during which they bore witness as he asserted various privileges and likely for the purpose of justifying his claims to resources such as productive salmon streams. At the conclusion of the ceremonies the chief distributed gifts to his guests, with the value of the gifts increasing according to the recipient's social prestige. Having accepted these gifts without objection, guests were estopped under potlatch law from disputing the chief's claims at a later time.

Early Methodist missionaries to British Columbia may have been the first to actively disdain the potlatch, which they said promoted idleness, encouraged drunkenness and prostitution, spread diseases, and impoverished its participants. By 1873 the Canadian Department of Indian Affairs had begun compiling complaints about the potlatch (Cole and Chaikin 1950, 14-15). Although sentiment from provincial authorities was that the potlatch would probably die of its own accord in time, complaints mounted. In January, 1885, the House of Commons passed amendments to the Canadian Indian Act making potlatching and related tribal practices a misdemeanor.

The first prosecution under the law occurred in 1889. The arrest, met with minor resistance, led briefly to the defendant's incarceration. Within weeks his supporters petitioned Chief Justice Sir Mathew Begbie for *habeas corpus*, which Begbie granted, stating at the same time that the law's definition of potlatch was so vague and ambiguous that it would be difficult for the prosecution to convict. Parliament, he opined, should

provide an adequate definition of a previously unknown offense if it expects the law to be enforced. Potlatch critics eventually prevailed on Canadian Parliament to rewrite the statute to more carefully define the prohibited offense (Cole and Chaikin 1990, Bracken 1997). In the meantime, the tribes, more populace than Europeans, took Begbie's words as license to continue potlatching.

The strongest adherents to potlatching were the "incorrigible" Southern Kwakiutl of northern Vancouver Island and the adjacent mainland (Cole and Chaikin 1990, 62).

When the Alert Bay Indian agent attempted to arrest guests invited to a potlatch at Fort Rupert in 1904, he was met with outright defiance. Initially, the crowd would not let him take the prisoners, but he eventually prevailed, leading to a \$10 per day fine for the three trespassers. In many cases Canadian Indian agents found it difficult to confront potlatchers gathered to solemnize marriages, the death of a respected chief, and other significant occasions. What could one say to the tribes' claims that potlatching was simply their version of the white man's Christmas celebrations, just innocent feasting and gift giving?

In 1913, Duncan Campbell Scott became the Deputy Superintendent of the Canadian Department of Indian Affairs in Ottawa. His views on Indian policy were draconian by today's standards, and perhaps by any. In his words, "[t]he happiest future for the Indian race is absorption into the general population . . . and this is the object of the policy of our government." In 1920 he declared that "our objective is to continue until there is not a single Indian in Canada that has not been absorbed into the body politic, and there is no Indian question, and no Indian department." Largely insulated from broader political forces, at least on the Indian question, he had considerable autonomy. He came down hard on the potlatch and persisted at it for 14 years until his retirement.

Almost singlehandedly, Scott succeeded in having the Indian Act amended to impose compulsory boarding school attendance for the young and, in 1918, to allow for summary procedures to suppress the potlatch. With summary procedures at their disposal, the authorities quickly moved to enforce the potlatch ban. WWI bolstered the ban's underlying force, with the citizenry under a broad and popular mandate to conserve resources to further the war effort. The alleged wastefulness of potlatching gave added momentum to suppression efforts.

The tribes pushed back, sending a petition to Ottawa calling for an investigation of the potlatch. When that failed, they sent a delegation of four representatives to plead their case with Scott. They said the potlatch was essential to the fabric of tribal culture and that the redistribution it entailed wasted nothing but instead helped to feed those who would otherwise be impoverished. If only the authorities would come west to observe a potlatch they would quickly recognize all this to be true. Scott was unconvinced and continued in his zeal to suppress the potlatch. In at least one instance Indian agents confiscated a substantial cache of goods assembled to host a large potlatch, which they donated to eastern museums followed by minor compensation to the owners (Bracken 1997, 215).

Eventually the tribes gave up pleading and accepted that public potlatching would have to stop. On observing a decline in potlatching, Indian agents declared the practice all but dead. It quickly became apparent, however, that many tribes had simply shifted their festivities to remote locations such as Kingcombe Inlet that were virtually inaccessible to Canadian authorities. A further iteration was the disjointed potlatch, which separated the feasting and dancing from gifting. Potlatch gifting became an increasingly private if unceremonious affair. This was difficult for its participants to cope with because public witness to a host's generosity was the Indian way of memorializing return obligations.

True to early predictions, potlatching began to wane as more Indians became Christianized and the young, increasingly interested in integrating into the white economy, forgot or ignored old ways. Tribal elders kept the potlatch spirit alive until repeal of the potlatch ban in 1951. The 1960s brought renewed interest in, and attention to, the old cultural practices, including the potlatch, which survives to this day as exhibition and possibly more.

Potlatch Economics

Evidence that tribal chiefs owned designated resource sites in the sense of being able to exclude others is beyond question. Trespassers were normally met with swift and violent retaliation. Chiefs managed their resources somewhat as stewards for the benefit of their tribes, and, in expectation of receiving a share of the output, tribal members contributed their labor to the busy salmon harvest.

The problem of trespass aside, exclusive property rights are costly to define and enforce. One especially troublesome cost associated with ETRs must have been stream-specific risk owing to local environmental shocks. Even within fairly close geographic proximity, rivers along the NWC can be affected differently by snowpack, flooding, drought, and variations in salinity or temperature, which can markedly affect salmon abundance for years to come. A tribe's decision to attach itself to a specific place meant it would have to suffer any resource failure in that locality owing to both stochastic variation and the success or failure of its own husbandry efforts. In this sense, exclusive property rights create risk for the resource owner that would otherwise be washed out under open access. They hold owners accountable for bad outcomes and reward them for good outcomes, whether or not of their own making.

According to the standard risk-return trade-off in economics, there must have been some offsetting benefit to the tribes in the form of higher expected returns for them to willingly bear this cost. The opportunity to make husbandry investments to increase the long-run productivity of salmon stocks free from intrusion by rival tribes is the likely benefit. A rudimentary example of such an investment would be a tribal leader's decision to harvest a relatively small proportion of an unexpectedly poor salmon run to allow a larger proportion of the run to spawn and build future generations. So-called "compensatory" fishing would have ensured healthy, sustained stocks. In contrast, for a tribe of stable population the natural tendency for a chief ignorant or unconcerned about salmon population dynamics would have been to harvest a fixed number of salmon from all runs, good or poor, allowing too few to escape and spawn in poor years—so-called "depensatory" fishing. To refrain from overharvesting incurs an opportunity cost, but with ETRs tribal chiefs interested in increasing wealth would have found the investment a net a gain.

My hypothesis is that potlatching was a substitute for violence in enforcing ETRs. Even under stable environmental conditions there would always have been a tendency for one tribe to encroach on others' territories—the standard tragedy of the commons outcome. But local environmental shocks would have dramatically increased the tendency for unfortunate tribes to encroach on their more fortunate neighbors. If Tribe A is in the good state of nature with a strong salmon run when Tribe B's run is poor, Tribe

B's labor productivity peacefully fishing its home territory may become dangerously low, while Tribe A will face ample productive uses for its scarce labor. The resulting differential in relative productivities gives Tribe B a comparative advantage in violence, even though in an absolute sense it may be the weaker tribe (Johnsen 1986, Anderson and McChesney 1994). For tribe B, the forgone opportunities from the credible threat of violence are lower than for Tribe A. If Tribe B is economically rational, its tendency will be to violently encroach on Tribe A's territory.

Owing to the positive wealth effect of long-term husbandry investments, Tribe A should be willing and able to compensate Tribe B to leave in peace. What is more, unless resource productivity is perfectly correlated across space the situation is reciprocal; Tribe A knows it is likely to find itself in the poor state at some point and in need of sharing in Tribe B's bounty. Costly violence is avoided, and all tribes are better off compared to open access. No wonder the tribes referred imploringly to potlatching as their "potlatch law" when it came under harsh scrutiny.

The war records of the NWC tribes bear repeated accounts of one tribe hearing of another's prosperity and sending its warriors to capture a share of the bounty (Ferguson 1979). In many cases the encroacher was met with violent retaliation, but as time advanced target tribes increasingly provided encroachers with tribute to leave in peace. These payoffs gradually evolved into the multilateral network of reciprocal wealth transfers known as potlatching. Contrary to anthropologists' characterization of the tribes as "hunter-gatherers" who were content with "subsistence" in a land of plenty (Codere 1950, Donald 1997), my view is that the tribes were more akin to salmon ranchers who affirmatively built their prosperity.

An important question is whether the tribes actually had access to wealth enhancing investment projects other than minor tweaks in the intensity of their fishing effort. It is implausible, as some cultural anthropologists have claimed, that the tribes lacked understanding of the anadromous character of Pacific salmon. In Drucker's words "it is doubtful whether the Indians understood the life cycle of these fish, . . . or connected the spawning with the tiny new-hatched par, or these with the adult salmon (Drucker 1955, 154)." Yet as early as 1868, Sproat reported that "[i]t is common practice among the few tribes whose hunters go far inland, at certain seasons, to transport the ova

of the salmon in boxes filled with damp mosses, from the rivers to the lakes, or to other streams” (Sproat 1868, 220).

Incurring the cost to transplant fertilized ova would have made little economic sense unless the tribes knew salmon return to their natal streams to spawn. Otherwise, the costs would have fallen on those doing the transplanting, while other tribes would have enjoyed most of the benefits when the offspring returned indiscriminately across streams. What is more, the investment probably consisted of more than simply gathering fertilized ova and transporting them to a barren stream or lake. Any stream that was barren of salmon would probably have been so because of physical obstacles to their migration. Such cases would have required some kind of re-engineering of the stream bed before transplanting could succeed.

Reports of the early spring “first salmon rite,” common in some form all along the NWC, confirm that tribal chiefs recognized the intergenerational connection between runs and may even have taken steps to engage in purposeful biological selection. Following a long winter of limited food production, tribal chiefs prohibited fishing for up to two weeks after spotting migrating salmon. Only after the chief ritually caught, cooked, and ate the first salmon could fishing commence under his supervision. The purported reason for delaying the catch was to avoid offending the salmon to ensure they would return in future years (Swezey and Heizer 1977). Absent delayed harvesting, early arriving salmon would otherwise have been eliminated from the gene pool, leaving only late arrivers to spawn. Late arriving parents tend to beget late arriving offspring. Early harvesting would therefore have been counterproductive. Whether the chief had more in mind than concern over offending the salmon we will never know.

Another example illustrates the plausibility of purposeful biological selection by tribal chiefs as a form of capital investment. To this day, various streams along the NWC produce relatively large Chinook salmon.⁴ Why would one stream produce larger fish than others if all the salmon feed in the same ocean? Where tribal property rights were

⁴ According to Bonenko “[r]ivers Inlet, about 250 miles north of Vancouver, hosts a limited run of the largest Chinook salmon British Columbia has to offer. From the standpoint of average weight, Rivers Inlet cannot be topped: Chinook salmon taken here typically average between 32 and 36 pounds (fisheries statistics reveal that, during 1971, Chinook taken from Rivers Inlet averaged 40.8 pounds!). The inlet may indeed host the largest race of king salmon to be found anywhere” (Bonenko 1980, 114). It may be no coincidence that Rivers Inlet lies in the epicenter of potlatch territory where, I suspect, ETRs and the incentive to make husbandry investments were strongest.

sufficiently secure, tribal chiefs had an incentive to invest in developing salmon stocks whose individuals were relatively large. To do this, a chief would have used a harvesting rule for taking the smallest salmon in the run, leaving the larger fish to spawn and reproduce. Because larger parents tend to beget larger offspring, over the course of generations this rule would have produced larger fish, but it is also counter-intuitive.

Although the tribes' salmon harvesting technology included dip nets, spears or harpoons, drift nets, etc., the fish weir was the most sophisticated. Construction of a weir involved a substantial capital investment. In many cases fence weirs were built to span an entire stream. The only way for salmon to pass was to enter a holding trap, giving attendants complete discretion over how many and which salmon were allowed to continue on to the spawning beds.

Other scholars of NWC tribes have begun uncovering evidence that they were far more sophisticated than once thought. One recent study reports that the advent of satellite imaging has identified an extensive system of rock retaining walls along the low-tide mark of the many inland waterways throughout the coast (Williams 2006). The author concludes that the tribes purposely engineered what she calls clam gardens by building these walls to allow the adjacent beach to backfill with biogenic sand, gravel, and shell debris ideal for promoting clam growth. The same study describes an Indian petroglyph at a known fishing site depicting salmon entering a weir. Clusters of tally marks, possibly indicating a count of salmon left to spawn, accompany the scene. The author concludes by pointedly rejecting the notion that the NWC tribes ventured across the Bering Straits some dozen millennia ago and simply stumbled into a land of plenty. In her view, as in mine, they built their prosperity through ongoing capital investment.

Potlatching as a Credit Market

Over the years, philosophers, sociologists, and anthropologists have questioned the recurring notion of the gift in so-called "archaic societies." Could what have been called potlatch gifts truly be considered gifts if the expectation of the giver was that he would receive equal present value in return at a later time?⁵ The question was of more

⁵ A good place for the interested reader to start on this subject is Bracken (1997). His work rests in part on Marcel Mauss's famous work, *The Gift* (1925). Within this literature, the gift is seen at once as both a

than academic interest in the decades leading up to the potlatch ban. Crown agents' conclusion that potlatching was socially wasteful, together with its alleged association with gambling, prostitution, and even the impoverishment of the giver, was the foundation on which the potlatch ban seems to have rested (Bracken 1997, 40-49). This conclusion follows from the assumption that a blanket transferred from Tribe A to Tribe B is a zero-sum transaction.

The NWC potlatch, however, was clearly a well-gearred system of reciprocity recognized by economists to be a powerful mechanism for establishing cooperation and trust and for enforcing property rights (Hoffman, McCabe, and Smith 19987). Among the Southern Kwakiutl there are said to have been exactly 658 named and numbered potlatch positions, with the number of the position indicating its holder's rank in Kwakiutl society.⁶ Rankings changed over time according to the participants' recent potlatch success, as demonstrated in the following passage from a Fort Rupert potlatch:

O friends! Let me ask you chiefs and new chiefs of my tribe, do you wish to be laughed at by our rivals? We are almost beaten by the Koskimo. We are only one potlatch ahead of them. After this pile has been distributed, we shall only be two potlatches ahead of them, instead of four as our fathers used to be. Take care friends! Our friends the Koskimo are strong in rivaling us in distribution of property. (Codere 1950, 119)

This passage not only demonstrates that potlatch participants kept score, but that potlatch gifts were not always required, with adjustments to social status providing the balance. A tribe that attempted to cheat by withholding on their generosity would have descended in the potlatch ranking. It is best to see reciprocal obligations for which the timing and event of repayment were conditional on the state of the world as subsequently revealed by nature.

reflection of self-interest and as a manifestation of concern for others. It also recognizes the gift as a substitute for violence and reciprocity as a trust-building mechanism.

⁶ The Southern Kwakiutl are the subject of the largest share of the ethnographic and historical record. Their potlatch practices were fairly representative of those observed up and down the NWC.

The social benefit of the potlatch among the tribes was the ongoing surplus it generated resulting from reciprocity's role in creating trust. The surplus included both the expected increase in resource productivity and the benefits of portfolio diversification each tribe enjoyed. The discounted present value of this surplus stream across all tribes was their common wealth.

From an economic standpoint, the conditional reciprocal obligations potlatching created can be seen as simple loans, a form of debt financing. When one tribe found itself in the bad state, for example, it had a choice. Should it engage in depensatory fishing by harvesting heavily to sustain itself in the short run and suffer the consequences down the road from allowing few too salmon to spawn, or should it engage in compensatory fishing by harvesting lightly now and allowing sufficient spawning to restore the run? Although wealth enhancing, the latter choice could result in substantial next-winter deprivation for the tribe absent the ability to borrow through the potlatch system.

That potlatch obligations sometimes went unreciprocated is no more troubling than that some current-day borrowers occasionally default on their loans. Today, lenders generally minimize the resulting losses by pre-screening a borrower's credit history, by insisting on contract terms that limit moral hazard, and by holding a diversified portfolio. Potlatch ranking bears an uncanny resemblance to today's credit histories and as a prestige barometer limited moral hazard. And, of course, it allowed the tribes to diversify stream-specific risk.

Franz Boas's ethnography leaves little doubt about the tribes' commercial sophistication or potlatching's role as their credit market. Most fundamentally, this is demonstrated by the tribes' immediate and widespread adoption of the Hudson's Bay blanket as the medium of exchange. In his words:

[T]he unit of value is the single blanket, now-a-days a cheap white woolen blanket, which is valued at 50 cents. The double blanket is valued at three single blankets. These blankets form the means of exchange of the Indians, and everything is paid for in blankets or in objects the value of which is measured by blankets. When a native has to pay debts and has not a sufficient number of

blankets, he borrows them from his friends and has to pay the following rates of interest:

For a period of a few months, for 5 borrowed blankets 6 must be returned . . . for a period of six months, for 5 borrowed blankets 7 must be returned . . . for a period of twelve months or longer, for 5 borrowed blankets 10 must be returned . . .

When a person has a poor credit, he may pawn his name for a year. Then the name must not be used during that period, and for 30 blankets which he has borrowed he must pay 100 in order to redeem his name. . . .

The rate of interest . . . varies somewhat around 25 per cent, according to the kindness of the loaner and the credit of the borrower. For a very short time blankets may be loaned without interest. (Boas 1966, 78)

Among other things, this passage reflects the normal upward sloping yield curve (that is, longer term loans required higher rates of periodic interest), the notion of compound interest, and the charging of an interest rate premium to reflect higher default risk. It also suggests that borrowers were sometimes required to post collateral, in this case in the form of their name. Because the name often gave the bearer certain valuable rights, including in some cases title to specific resource sites, pawning it was a serious matter. No doubt the interest rates reported above were somewhat circumstantial, because elsewhere Boas and others refer to rates of interest as high as 100 percent (Boas 1966, 78).⁷

The act of pledging an asset as security for a debt, with the borrower retaining possession of the asset and the lender having a right to seize it, is known in modern law as hypothecation.⁸ It is unclear in the earlier passage whether the pawning of a name

⁷ According to Sproat (1868), “[i]f an Indian impelled by rivalry with another, decides on holding a Patlach [sic], he often has to borrow blankets [which here serve as currency, not clothing] from richer men and they charge him two blankets for one, thus fostering grinding usury” (quoted in Bracken 1997, 48). A 100% rate of interest may seem high by current standards, but it is entirely plausible in light of transaction costs, default risk, wear and tear on blankets, and, on the other side of the equation, the need for capital to finance high-return investment projects. In Chicago’s mid-1800s *sub rosa* fractional reserve grain markets, interest rates of 40 percent were common (Williams 1984, 490).

⁸ A simple car loan illustrates hypothecation. The lender typically holds legal title to the car, with rights to repossess it under certain conditions. The borrower retains equitable title to the car, which includes the conditional right to possess and use it. If the borrower defaults, the lender repossesses.

amounted to hypothecation, but in any event the tribes achieved hypothecation with cold forged, artistically engraved copper plates known as “coppers.” (Fig. 5). According to Boas:

Still more complicated is the purchase or the gift, however one chooses to term it, of a “copper.” All along the North Pacific Coast, from Yakutat to Comox, curiously shaped copper plates are in use, which in olden times were made of native copper, which is found in Alaska and probably also on Nass River, but which nowadays are worked out of imported copper. The front of the copper is covered with black lead, in which a face, representing the crest animal of the owner, is graven. . . . [C]oppers have the same function which bank notes of high denominations have with us. The actual value of the piece of copper is small, but it is made to represent a large number of blankets and can always be sold for blankets. The value is not arbitrarily set, but depends upon the amount of property given away in the festival at which the copper is sold. On the whole, the oftener a copper is sold the higher its value, as every new buyer tries to invest more blankets in it. Therefore the purchase of a copper brings distinction, because it proves that the buyer is able to bring together a vast amount of property.

The purchase of a high-priced copper is an elaborate ceremony . . . The trade is discussed and arranged long beforehand. . . . The buyer offers first the lowest prices at which the copper was sold. The owner declares that he is satisfied, but his friends demand by degrees higher and higher prices, according to all the previous sales of the copper. . . . Finally, the amount offered is deemed satisfactory. Then the owner asks for boxes to carry away the blankets. These are counted five pairs a box, and are also paid in blankets or other objects.

. . . This whole purchase is called “putting the copper under the name of the buyer.” (Boas 1966, 84-85)

This passage clearly reveals a credit market involving hypothecation, with the seller of the copper being the borrower and the buyer being the lender. The copper served not only as collateral for the loan, but it reflected tangible evidence of indebtedness that

could be sold off in the secondary market, an important feature in a world where low resource productivity could randomly strike any tribe in the system.

The market for coppers was multilateral in the sense that third parties were free to buy one for a negotiated price. In a system subject to multilateral resource variability, exclusive reliance on bilateral transactions would have been cumbersome. There was no guarantee the original seller would be in the good state when the original buyer later found itself in the bad state. It appears the copper owner could exercise a kind of put option against any other chief,⁹ including the original issuer (Boas 1897, 345-46), whose trusted family crest was inscribed on the copper for identification (Boas 1966, 82).

In essence, a copper appears to have been a kind of communal demand note. At any time, with due notice, the current owner could demand that the target chief buy the copper for a price higher than any price it had previously commanded. If the target of the offer declined, he lost social prestige. Remarkably, the prices at which the copper sold in the secondary market would have reflected participants' expectations regarding the originator's investment success; a reliable market signal generated in arm's-length transactions.

Though this is the only evidence I have come across, it suggests that the originator was the ultimate guarantor of the loan. If the originator declined, he lost status and the seller gained status. Alternatively, if the originator had used the loan proceeds to undertake profitable investment projects he would be able to buy the copper back with interest and extinguish the debt.

There is evidence title disputes to resource sites arose from time to time. When they did, the claimant held what is known as a rivalry potlatch as follows:

When two chiefs claimed the same place, the first one would give a potlatch, stating his claim; then the second would try to outdo him. Finally, one or the other gave away or destroyed more property than his opponent could possibly equal. The one who had been surpassed had no recourse. He could no longer contest his claim, for, in the native mind, it came to be regarded as ridiculous that

⁹ A put option allows, but does not require, the holder to sell an asset to the option issuer at a stated strike price.

an individual of few resources (and of course this involved not only the man, but his entire local group) should attempt to make a claim against someone who had demonstrated power and wealth. (Drucker 1955, 128)

The rivalry potlatch is an example of Coasean bargaining at work (Coase 1960). The winner of the potlatch was likely the most efficient resource manager and the highest valuing user of the resources whose title was under dispute. The potlatch gifts he offered served as compensation to the loser. Transaction cost were sufficiently low that no one was made worse off, given the alternatives.

There is little doubt the tribes' used the potlatch system, including the creation and transfer of coppers, as a credit market to finance capital investments including improvements in salmon streams. But this leaves a puzzle. If every blanket loaned created a debt of equal present value, why did the tribes so steadfastly refuse to give up potlatching?¹⁰ Extinguishing potlatch debts would have been a zero-sum game. The winners more or less would have offset the losers. The tribes' stubborn resistance to the ban suggests that something worse than a zero sum game was in the making.

A possible explanation is that the threat the potlatch ban posed to the enforcement of tribal property rights was sufficient to explain their resistance. The problem with reliance on this explanation is that, by the time the Canadian Indian authorities started to enforce the ban in earnest, the mixed stock marine salmon fishery was subject to the law of capture, rendering rights to fish specific streams far less valuable than before.

My hypothesis is that the potlatch system was more than a simple credit market, it was an informal system of fractional reserve banking. If so, it would have allowed the tribes to expand their money supply well beyond the number of blankets in circulation or storage. The resulting availability of added credit would have helped finance profitable investment projects that would otherwise have been lost. The prospect of a potlatch ban

¹⁰ Zero sum, that is, aside from tearing away the fabric of their culture. As an economist, my first tendency is to explain cultural norms as instruments of any peoples' attempt to maximize wealth. But I am also agnostic as to what things might properly be counted in the wealth calculus. I do not discount the possibility that culture had value, *per se*. Nor do I discount its more subtle instrumental role in economizing on information by serving as a basis for group identity and solidarity. At the same time, American Indians have repeatedly shown themselves perfectly willing to abandon cultural traditions when necessary to adapt to new opportunities (Dupris, Hill, and Rogers 2006).

therefore would have been devastating, in the same way that abandoning fractional reserve banking would be today.

The essence of fractional reserve is rehypothecation, in which the collateral is re-used by the borrower/depository to back additional loan. As a result of rehypothecation the number of blankets promised for repayment would have vastly exceeded the number of blankets in the community. The wholesale cancelation of potlatch debts would have contracted the money supply, drying up credit, restricting capital investment, and dramatically reducing the common wealth.

Was potlatching an informal system of fractional reserve banking? In the absence of more evidence, one way to test the hypothesis is to determine whether the necessary pre-conditions for fractional reserve were present. Four conditions suggest it was. The first condition is the existence of a good, such as gold or grain, whose quality most market participants can identify at fairly low cost (Alchian 1977). There is little doubt the Hudson's Bay blanket met this condition for the NWC tribes.

Second, there would have to be some mechanism to establish evidence of indebtedness. For ordinary potlatch transfers the tribes' oral histories accomplished this, but coppers were tangible evidence of indebtedness, and they circulated among the tribes just as we would expect of commercial paper today.

Third, there would have to be some provision for storing blankets. Most fractional reserve banking systems have relied on specialized, centralized storage, but this would not have been necessary. Among the tribes, storage was widely distributed across the populace. The record is clear that every house and every family held uniform cedar boxes of blankets, "five pairs a box." These boxes could be found in the tribes' family long-houses stacked in an orderly way to partition rooms for household members. This explains why it took time for a chief to assemble the blankets necessary to host a successful potlatch.

Oberg (1978, 101, 118, 127-28) reports that for the Tlingit, well north of the Vancouver Island, potlatch goods consisted exclusively of durables that were supposed to remain unused until given away in a subsequent potlatch. While this may have been the prevailing norm, in times of hardship the norm gave way to necessity. Of course, the

custodian would likely have to account for any obvious wear and tear the next time he hosted a potlatch and gave them away.

The fourth and final condition necessary for fractional reserve banking is trust. In the case of London's goldsmith-bankers and Chicago grain merchants, trust accumulated over the long course of dealing. Trust is much more likely to arise in the context of repeat transactions between known parties. The potlatch system appears designed to have created and maintained trust, both as a credible promise against encroachment on others' resource sites and as a bond of creditworthiness.

One final factor that would point to potlatching as system of fractional reserve is direct evidence of an expansion of the money supply. Statements by Boas, clearly demonstrate an expanded money supply, as well as the devastation the potlatch ban would likely bring. In his words:

The economic system of the Indians of British Columbia is largely based on credit, just as much as that of civilised [sic] communities. . . . The Indian has no system of writing, and therefore, in order to give security to the transaction, it is performed publicly. The contracting of debts, on the one hand, and the paying of debts, on the other, is the potlatch. . . This economic system has developed to such an extent that the capital possessed by all the individuals of the tribe combined exceeds many times the actual amount of cash that exists. That is to say, the conditions are quite analogous to those prevailing in our community: if we want to call in all our outstanding debts, it is found that there is not, by any means, money enough in existence to pay them, and the result of an attempt of all the creditors to call in their loans results in a disastrous panic from which it takes the community a long time to recover.

. . . The sudden abolition of this system—which in all its intricacies is very difficult to understand . . . destroys therefore all the accumulated capital of the Indians. It undoes the carefully planned life-work of the present generation, exposes them to need in their old age, and leaves the orphans unprovided for. What wonder that it should be resisted with vigour [sic] by the best class of

Indians, and that only the lazy should support it, because it relieves them of the duty of paying their debts (Boas 1898, 681-82).¹¹

Conclusion

According to the Royal Proclamation of 1763, the aboriginal people of what has since become Canada, including tribes then occupying territories whose rivers flow into the Pacific, retained the right to possess traditional lands they had not surrendered by cession or treaty to agents of the Crown (Bracken 1997, 40, Flanagan, Alcantara, and Le Dressay 2010, 58-59). The English common law in the age of discovery accorded with the Royal Proclamation, finding that aboriginal title was judicially enforceable against settlers as long as it could be “studied and understood.”¹²

The story of the NWC tribes is ultimately about the clash of two civilizations in a practical economic and legal vacuum. Ideally, customary law on the NWC would have immediately trumped the law of capture through legal recognition of aboriginal title and traditional fishing rights, and, if not, through Coasean bargaining. In an ideal world of zero frictions, a terminal, riverine salmon fishery under ETRs is far more efficient than our open access commercial marine fishery (Higgs 1982). Collectively, we would all be better off without it. The trouble in practice is that tribes, cultures, nations, civilizations, and their conflicting laws, compete in an open-access commons subject to no higher authority than their own agents, who are seldom perfect representatives of the common wealth and who, in most events, have little immediate incentive to study and understand others’ institutions.

This essay reflects emerging economic study and understanding of the NWC tribes and the property rights institution known as the potlatch. Potlatching allowed the tribes to prosper and by accumulating notable wealth through well functioning capital markets and to husband their salmon stocks in a way far more efficient than our current

¹¹ The reference in the above passage to repayment in “several years” is routine in the historical record and may be telling. Why not in one year? The answer may be that investment in husbanding a particular stock of salmon would not have paid off until one generation’s offspring return to spawn in anywhere from two to six years, depending on the species. The term of the loan may have been matched to the life cycle of the stocks being husbanded. This leads to a testable implication. For example, in a river known to support only Pink salmon, which are on a two-year life cycle, the term of the standard loan would have been two years. In a river known to support only Chinook salmon, which average a six-year life cycle, the standard loan term would have been six years.

¹² *In Re Southern Rhodesia* [1919] A.C. 211.

marine salmon fishery. The potlatch ban destroyed all that, plunging the tribes into the equivalent of a sustained Great Depression that continues to hamper First Nations' economic development. This economic understanding, along with recent Canadian legislation (Flanagan, Alcantara, and Le Dressay 2010, 137-159), provides a solid foundation for unlocking the wealth of British Columbia's First Nations.

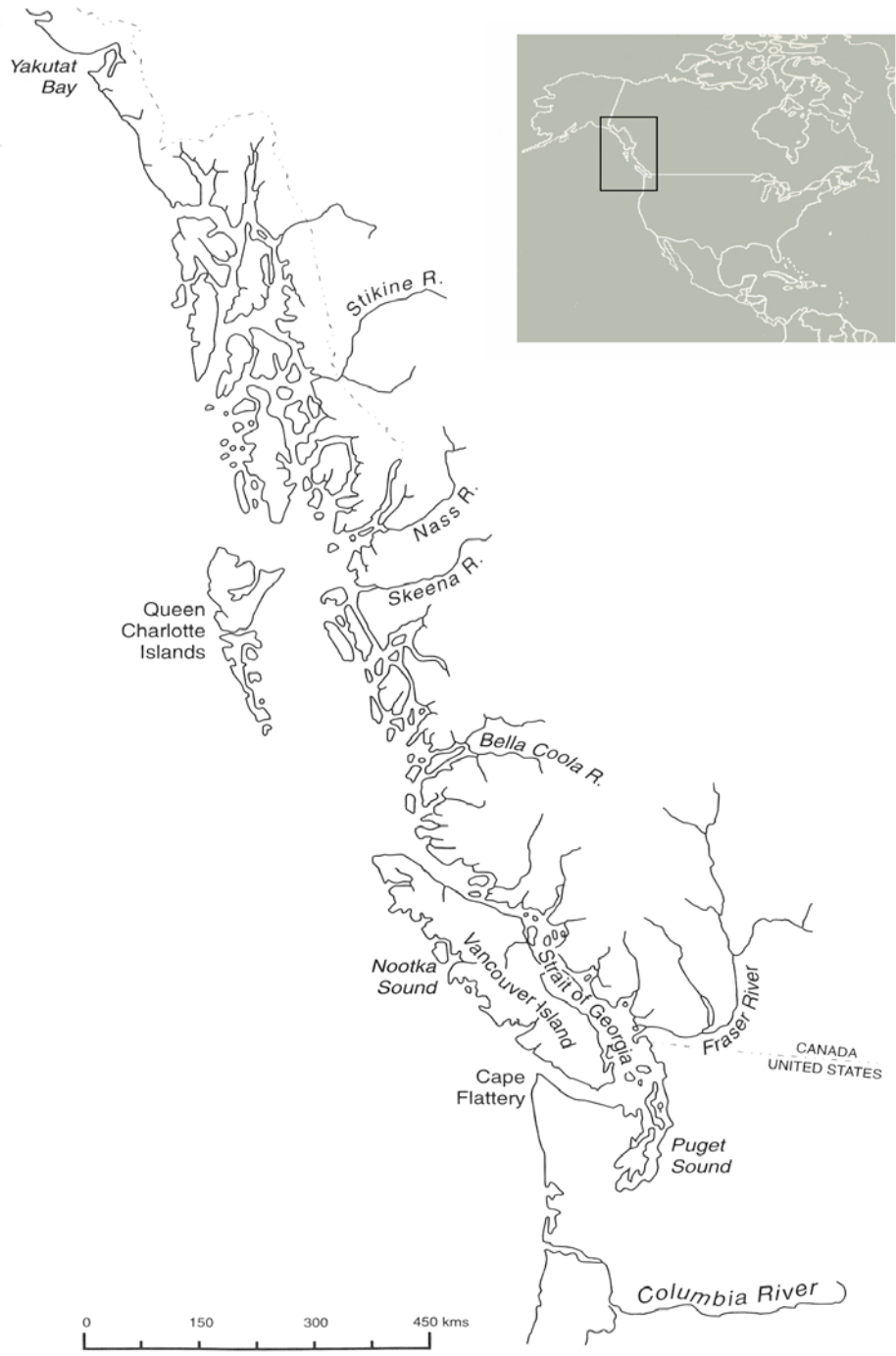


Figure 1: Map of the NWC

References

- Alchian, Armen A. 1977. Why Money? *Journal of Money, Credit, and Banking* 9, 133-140.
- Anderson, Terry L., Frederick S. McChesney. 1994. Raid or Trade? An Economic Model of Indian-white Relations, *Journal of Law & Economics* 37: 39-74.
- Boas, Franz. 1898. *Summary of the Work of the Committee in British Columbia*. In *Report of the British Association for the Advancement of Science*, 667-82. London: J. Murray.
- _____. 1966. *Kwakiutl Ethnography*, ed. Helen Codere. Chicago, London: University of Chicago Press.
- Bonenko, Allen . 1980. *Pacific Salmon Fishing*. London: The Tantivy Press.
- Boyd, Robert. 1999. *The Coming of the Spirit of Pestilence: Introduced Infectious Diseases and Population Decline among Northwest Coast Indians 1774–1874*. Seattle: University of Washington Press.
- Bracken, Christopher. 1997. *The Potlatch Papers: A Colonial Case History*. Chicago, London: U. Chicago Press.
- Coase, Ronald H. 1960. The Problem of Social Cost. *The Journal of Law and Economics* 3: 1-44.
- Codere, Helen. 1950. *Fighting with Property*. New York: J.J. Augustin.
- Cole, Douglas, and Ira Chaikin. 1990. *An Iron Hand Upon the People: The Law Against the Potlatch on the Northwest Coast*. Seattle: University of Washington Press.

Costello, C., Gaines, S. D., and Lynham, J. 2008. Can Catch Shares Prevent Fisheries Collapse?, *Science* 321, 1678-1681.

Donald, Leland. 1997. *Aboriginal Slavery on the Northwest Coast of North America*. Berkeley: University of California Press.

Drucker, Philip. 1950. *Indians of the Northwest Coast*. New York: McGraw-Hill.

Drucker, Philip. 1965. *Cultures of the North Pacific Coast*. Chandler: San Francisco.

Dupris, Joseph C., Kathleen S. Hill, and William H. Rodgers, Jr. 2006. *The Si'lailo Way: Indians, Salmon & Law on the Columbia River*. Durham: Carolina Academic Press.

Flanagan, Tom, Christopher Alcantara, and André Le Dressay. 2010 *Beyond the Indian Act: Restoring Aboriginal Property Rights*. Montreal & Kingston, London, Ithaca: McGill-Queen's University Press.

Ferguson, B. 1979. Warfare and Redistributive Exchange on the Northwest Coast. In *The Development of Political Organizations in Native North America*, ed. E. Tooker. Washington, D. C: Proceedings of the American Ethnological Society. 133-47.

Haddock, David D., and Robert J. Miller. 2006. Sovereignty Can be a Liability: How Tribes Can Mitigate the Sovereign's Paradox. In *Self-Determination: The Other Path for Native Americans*, ed. Terry L. Anderson, *et al.* Stanford: Stanford University Press, 194–213.

Hardin, Garrett. 1968. The Tragedy of the Commons. *Science*, 162 no. 3859: 1243-1248.

- Harris, Douglas C. 2001. *Fish Law and Colonialism The Legal Capture of Salmon in British Columbia*. Toronto: University of Toronto Press.
- Hendry, A. P., Wenburg, J. K., P. Bentzen, P., E.C. Volk, and T.P. Quin. 2000. Rapid Evolution of Reproductive Isolation in the Wild: Evidence from Introduced Salmon. *Science* 290: 516-518.
- Higgs, Robert. 1982. Legally Induced Technical Regress in the Washington Salmon Fishery. *Research in Economic History* 7: 55-86.
- Hoffman, Elizabeth, Kevin McCabe, and Vernon Smith. 1998. Behavioral Foundations of Reciprocity: Experimental Economics and Evolutionary Psychology. *Economic Inquiry* 36: 335-52.
- Hunt, George and Franz Boas. 1987. *The Social Organization and the Secret Societies of the Kwakiutl Indians*. In *The Report of the U.S. National Museum for 1895*, 311-737. Washington: Government Printing Office.
- Jewitt, John R. 1987. *The Adventures and Sufferings of John R. Jewitt : Captive of Maquinna*. Vancouver/Toronto: Douglas & McIntyre.
- Johnsen, D. Bruce. 1986. The Formation and Protection of Property Rights Among the Southern Kwakiutl Indians. *Journal of Legal Studies* 15: 41-67.
- _____. 2001. Customary Law, Scientific Knowledge, and Fisheries Management among Northwest Coast Tribes. *New York University Environmental Law Journal* 10: 1-69.
- _____. 2006. A Culturally Correct Proposal for Privatizing the British Columbia Salmon Fisher. In *In Self-Determination: The Other Path for Native*

- Americans*, ed. Terry L. Anderson, *et al.* Stanford: Stanford University Press, 94-134.
- _____. 2007. The Si'lailo Redux. *THE GREEN BAG* 10: 245-65.
- _____. 2009. Salmon, Science, and Reciprocity on the Northwest Coast, *Journal of Ecology and Society* 14: Article 43 (available at <http://www.ecologyandsociety.org/vol14/iss2/art43>)
- Marsh, G. P. 1874. *The Earth as Modified by Human Action*. New York: Scribner, Armstrong & Co.
- Oberg, Kalervo. 1973. *The Social Economy of the Tlingit Indians*. Seattle: University of Washington Press.
- Quinn, Stephen F. 1994. *Banking Before the Bank: London's Unregulated Goldsmith-Bankers, 1660-1694*. Urbana-Champaign: University of Illinois Press.
- Sproat, Malcom G. 1868. *Scenes and Studies of Savage Life*. London: Smith Elder.
- Swezey, S. L. & Heizer, R. F. 1977. Ritual Management of Salmonid Fish Resources in California, *Journal of California Anthropology* 4, No. 5. <http://escholarship.org/uc/item/0rg7c5vf>.
- Williams, Judith. 2006. *Clam Gardens*. Vancouver: New Star Books.