Montagnais Hunting Dynamics in Historicoecological Perspective

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RÉSUMÉ

Cet article décrit la dynamique de la chasse chez les Montagnais avant sa transformation par le commerce des fourrures. Les *Relations des Jésuites,* le récit de Le Jeune en particulier, fourniront la base de l'analyse. Il est supposé que le cycle de la chasse saisonnière correspond à une relation entre la réalisation de la valeur maximale de la nourriture et le principe du moindre effort. En corollaire, la conservation naturelle en est le résultat. Les rapports contemporains indiquent que, sous des conditions idéales, le rendement est quelquefois équivalent à la ration requise, tandis qu'une analyse alimentaire basée sur le récit de Le Jeune démontre l'écart entre la consommation d'énergie et le rendement, dans des conditions adverses. La ration durant cet hiver n'était pas plus qu'un tiers des 4,800 calories requises par personne par jour. Avec l'arrivée du commerce des fourrures, l'épuisement du gibier a réduit les possibilités de chasse et a conduit à l'abandon de la conservation de la nourriture pour l'hiver.

The aim of this paper is to examine the diary of the Jesuit missionary Paul Le Jeune and his account of a winter spent among the Montagnais in 1633-34 (JR VII: 67-211) from an ecological perspective. His account will be appraised in terms of modern anthropological theory to evaluate aboriginal hunting dynamics and to determine the effects of European contact upon these dynamics.

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The analysis is focused on a nutritional study of the winter hunting cycle. I have hypothesized that the seasonal hunting cycle ideally corresponds to an association between maximum food value attainment and the principle of least effort. A corollary to be tested is that if this association holds true, natural conservation is the result. These hypotheses have been derived from a variety of sources, though the concepts have generally been ill-defined and have not been pursued in detail (Cox 1973; Elberg and others 1972; Lee and Devore 1968; Lee 1969). The seventeenth century Montagnais hunting economy will also be evaluated as to its "aboriginality", since it is likely that Montagnais hunting practices and economic life were already in the process of change when first described by the French.

THE AREA AND THE PEOPLE

References to the Montagnais in the early seventeenth century are numerous, although these are exclusive of interior bands whom the French had not yet encountered. They were first known in the area between Tadoussac and Three Rivers along the north shore of the St. Lawrence River. Their hunting grounds at that time extended as far as the Appalachian watershed south of the river. These areas, of a mixed boreal and deciduous forest type, are characterized by severe winters of four to five months duration. Accumulations of ten to fifteen feet of snow are not uncommon, though the amount on the ground at any one time is approximately five feet or less (JR V:123; XLXIX:159; Champlain II:44). Summers are short by contrast, with no more than a 140-day growing season.

The *Jesuit Relations* (VI:271-273) point out that moose, beaver, and the woodland caribou were hunted by the Indians, as were bear, badger, porcupine, fox, hare, marten and three kinds of squirrel. Birds were also taken in large numbers, especially white and grey geese, ducks, teals, ospreys, divers, partridges, and woodcocks. The varieties of fish and water animals included salmon, pike, carp, sturgeon, whitefish, smelt, doré, eels, and turtles. Frogs were not considered fit for human consumption. The Montagnais were gatherers too, and raspberries, strawberries, cherries, wild apples and grapes supplemented the meat and fish diet. All

of these resources were seasonal and none alone could constitute a year-round subsistence base.

Many statements can be found in the *Jesuit Relations* concerning the Montagnais way of life: "they wander through the woods, and climb the summits of mountains of prodigious height, hunting for moose, caribou, and other wild animals" (JR XXXVI: 221). Le Jeune (JR VI:277) stated that "during the months of September and October they live for the most part upon fresh eels; in November and December and often in January, they eat smoked eels, some porcupines, which they take during the lighter snowfall, as also a few beavers. When the heavy snow falls, they eat moose meat... to live upon the rest of the time until September; and with this they take a few birds, bears, and beavers, which they take in the spring and during the summer". Champlain (II:44) noted that eel fishing was an activity lasting from the 15th of September to the 15th of October. From this we may conclude that the subsistence pattern was characterized by summer amalgamations along the shores of the St. Lawrence with band breakup and seasonal movement into the interior commencing in the fall. Le Jeune's account best describes this behaviour in reference to the route chosen (or imposed) and group composition.

Le Jeune's group set out in a northerly direction from Quebec City on November 12, 1633, whereupon they were informed "that there were a great many Montagnais where they wished to pass the winter" (JR VII:107). They were subsequently joined by two other groups, and having learned that hunting up north was not good, decided to pursue a more southerly direction on the south shore of the river. This indicates that the low and late snowfall of that year did not provide the most favourable milieu for the stalking of game, and suggests that the Indians were adopting a strategy of dispersal designed to alleviate the crisis.

In contrast to the band with a membership of 150 to 300, and summertime aggregates to upwards of 1,000 individuals gathering on the banks of the St. Lawrence (Leacock 1969:9-11), the winter hunting party oscillated between a multilodge group of approximately 35 to 75 individuals and a single multi-family lodge group of 10 to 20 individuals. Le Jeune's party initially had a membership of 19, and after other groups joined them, member-

ship rose to 45. A month later, one of those groups decided to leave so they would be spread out over a wider area (JR VII:147). This indicates that group cohesion was based on the amount of game available. The basic socio-economic unit was not the nuclear family, since the nature of the game and dangers involved eliminated single-hunter groups as a viable unit. An efficient hunting pattern would have been difficult to maintain were it not for a strategy of dispersal *and* group membership flux.

While less-skilled kinsmen were certainly supported, hunting skill played an important role as far as matrimonial success was concerned. The Apostate[1] in Le Jeune's account provides an interesting example: "...the Savages jeered at him for being sedentary and not wandering.. the women make fun of him.. he would die if not fed... and gets lost in the woods like a European" (JR VII:173). Not only is a man such as this despised but "such men cannot find wives or retain them — the Apostate has already had four or five."

MONTAGNAIS HUNTING DYNAMICS

Montagnais nomadism was based on hunting "sedentary fauna" of which the beaver was an important component. It was the beaver that the Indians could hunt when the larger game animals were difficult to pursue or were not to be found at all. The Montagnais were not restricted to *one* resource as the bands farther north were. The Naskapi for example, specialized in the mass hunting of caribou in areas where few alternate resources were available. Under such circumstances, the failure of herds to appear or even their delayed appearance had serious consequences. By contrast, the more generalized hunting patterns and broader resource base of the southern forests buffered the Montagnais from the effects of such fluctuations.

For analytical purposes, the writer favours the framework used by Cleland (1966:43-45). Cleland suggests that adaptations,

[1] Taken to France as a child, Pierre Antoine Pastedechouan returned six years later. This experience caused him to forget his way of life. Truly a victim of circumstances, he was to die of starvation alone in the woods some two years after his association with Le Jeune. (Brown 1966, I:533)

or economies, may approximate one of two polar types — focal and diffuse. The former develops only in the presence of a very reliable and readily available resource. Such an adaptation involves specific techniques for maximizing successful exploitation, and the hunting of the migratory caribou by the Naskapi is an example of such an economy. The Montagnais' is a diffuse economy; adaptation is not based on the reliability of one resource, but on an ability to exploit a variety of resources, seasonal or otherwise. Moose, for example, is generally considered erratic and sparsely distributed, and moose hunting itself is regarded as a very unreliable activity (Feit 1973:118). Recourse to the beaver is then in effect a buffer mechanism, permitting a shift of emphasis upon another prey species.

A shift in emphasis may be brought about by certain variables which must be considered if an association between group cohesion and resource availability is to be established. One of these is faunal fluctuation. As Feit (n.d.:27) has pointed out, "the beaver, as well as other game animals, large and small, were periodically subject to severe fluctuations of populations". He adds that beaver interact with comparatively few components of the ecosystem, and neither is affected by nor affects them. As its isolation is generally keynoted by its stability, in contrast to moose, it is clear why "the beaver to them (the Montagnais) is like the bison to the Plains Indians" (Speck 1915:293). Concerning the moose, the *Relations* inform us that (1636) "not since ten years have the Savages killed so many moose" (JR IX:71), and this may be interpreted as a result of population fluctuation, though this is difficult to substantiate given the data available. Another variable, that of snowfall, may also determine resource availability insofar as it is ancillary to successful hunting. The Montagnais "may not be pressed with famine every year, yet they run the risk every winter of not having food, or very little, unless there are heavy snowfalls and a great many moose, which does not happen often" (JR VII:51). The worst, of course, is an adverse combination of both variables, but even one may cause starvation.

References in the *Jesuit Relations* persist in drawing a close relationship between snowfall and successful hunting, for example: "The snow was deep this year — five or six feet in the woods; consequently moose hunting was excellent" (JR XLIX:159). Le

Jeune was bluntly told "there is not enough snow to kill moose, beaver, or porcupine" (JR VII:145). The depth of the snow alone did not determine the success of the hunt, but rather its condition: "sometimes they chase one of these animals for two or three days, the snow being neither hard nor deep enough; while at other times a child could almost kill them, for, the snow being frozen after a slight thaw or rain, these poor moose are hurt by it and cannot go far" (JR VI:295). Similar observations have been made by Feit (1973:119) for the contemporary Waswanipi Cree. Their preference is to hunt "on moose days, when there is a slight wind that covers low noises made by the hunter, when the temperature is cold so that the wet snow does not stick to their snowshoes and make walking difficult, but not too cold so that the snowshoes do not make excessive noise on the hardened snow and so the branches of trees and shrubs are not brittle and easily cracked."

Successful hunting depends a great deal on specific conditions permitting exploitation with minimum effort. Moose hunting, unreliable as it may be, is not a random business. Contemporary observations indicate that hunters "search the hills for signs" or look for the characteristic packed-snow paths used by the moose (Feit 1973:118-119), and moose behaviour is indeed predictable to a degree. If signs are wanting, the hunter will not waste his time and energy in futile pursuit unless conditions are so bad that even small game is difficult to catch. It would then be to his advantage to hunt for game that provides the most meat. "Scanning" for game is part of strategy that determines how energy is expended (Lee and Devore 1968:307-308): "when our people saw that there was no longer any game within 3 or 4 leagues of us, we broke camp" (JR VII:109). Under ideal conditions it has been observed that "after one and a half or two hours of steady walking on snowshoes a man will have completely exhausted a moose" (Feit 1973:119). By contrast, "it was not easy to approach these animals in the summer" (Jenness 1932:46) — the situation may then be similar to when conditions are bad in winter.

The fact that the Montagnais hunted when it was most productive, when the snow is deep and the conditions right, and fished when it required relatively little effort to fish in the summer (JR VI:309), indicates that the "principle of least effort" was an

important operative concept for them. Paine (1973:303) acknowledged that it was also operative among the Waswanipi, but suggested that the principle ceased to be of consequence when a certain "low" in yields was reached. While Paine was referring to continuous hunting which ultimately reduces the species population (ie: moose) to a level where hunting is no longer profitable in terms of energy expenditure, I would argue that the principle of least effort is invariably subject to environmental conditions. Paine assumed that abundant game as well as good weather and snow conditions were *initial* circumstances permitting continuous hunting, yet the *Relations* demonstrate that such a situation was rare. The hunter will probably exert as much energy in the hunt when there are many moose but a lack of snow as when there are few moose but excellent weather and snow conditions. In order to approach the principle of least effort as closely as possible, if natural conditions do not warrant it, adjustments are made by higher frequencies of moves, maintenance of populations at lower densities, and resource emphasis shift.

Correlation between minimum energy expenditure and the seasonal pursuit of certain fauna is even closer than the preceeding discussion would indicate. Moose are said to be in prime condition as to both venison and robe in the winter season (Cooper 1946: 286). Furthermore, moose meat has a comparatively higher fat content in late winter and early spring, as opposed to the summer season and the rutting season in early fall (Feit, pers. comm.). Feit noted that under ideal conditions, Waswanipi output may be as great as 20 moose for one man per work day. Thus, there is a definite association between maximum food value and minimum energy expenditure.

Few attempts have been made to correlate seasonal subsistence efforts with *seasonal* caloric values of particular resources. Lee's input-output analysis of the !Kung Bushmen (1969:73-94; 1968:30-48) only took into account seasonal conditions, and not the seasonal variations in caloric value of the resources. It was found that "during the lean season of the year, the availability of the staple mongongo nut reaches an annual low, and people have to walk farther and work harder in order to maintain an adequate diet. In other words, a higher energy input yields a relatively lower caloric output".

For the Montagnais, unlike the !Kung, reducing the seasonal input-output gap depended upon prevailing conditions, and not solely on the availability of resources. The !Kung must work harder in the dry season to maintain the same dietary intake as in the wet season. Conversely, the Montagnais, no matter how hard they might have worked during the winter, depended upon environmental conditions of the moment that determined either a high or low food intake. To illustrate the hardships of the Montagnais winter group, Table I has been compiled. It represents the recorded detail for the entire winter of 1633-34. The following analysis (Table II) clearly indicates the wide gap between input and output under adverse conditions, and the slim margin between starvation and satiety.

Le Jeune had quoted a Montagnais to the effect that "to live moderately well and without suffering they had to have a moose every two days" (JR VII:181). This statement was made in reference to the size of the group at that time, that is, twenty individuals. Although the age and sex of the moose is not specified, an average weight of 700 pounds is not unreasonable. Allowing a wasteage factor of 50% (Cleland 1966: Table 6; Feit — pers. comm.), we are left with 350 pounds of edible meat. Consumption can therefore be estimated at approximately 8 pounds per person a day. If an average seasonal value of 600 calories per pound is used (W. Kemp — pers. comm.), the per capita intake is roughly 4,800 calories daily. This figure may be justified if it is considered that the Montagnais were on a 100% meat diet, that "moose meat does not remain long in the stomach" (JR VII:181), and that "in a cold area it makes good sense to eat a lot of meat" (Lee and Devore 1968:93). This figure also compares favourably with Feit's estimate of 4,500 calories for the Waswanipi bush population (1973:121, and pers. comm.). Accordingly, this calculated estimate should be compared with the last column of Table II, and the average caloric intake for all days considered in the sample.

It must be realized however, that waste percentages depend not only on the age and sex of the animal, but on how hungry the consumers are. It is likely that more than 50% of a moose could have been consumed. Additional fauna may also be unreported, and the eating of bark, skins, etc., cannot be analyzed. Caloric

TABLE I: DETAILS ON RESOURCES CAUGHT AND EATEN DURING THE WINTER OF 1633-34

DATE	PEOPLE	RESOURCES	SOURCES
Oct. 18	19	barrel sea biscuits, sack of flour, bread wine corn	JR, VII: 71
Oct. 20	19	"some birds"	: 73
Oct. 21-28	19	"piece of biscuit"	: 81
Oct. 30-Nov. 12	35	"eels, flour, peas"	: 91, 97-99
Nov. 12-15	45	"provisions low"	: 107
Nov. 20-Dec. 6	45	"no more beavers and porcupines"	: 121
		"no food-banquet of smoke"	: 137
		"little frozen water"	: 139
Dec. 20	20	"hunger drove us on - no game or at least very little of it"	: 145,147
Dec. 24-26	20	"a porcupine, a hare"	: 145,157
		"four or more beaver"	: 159
		"tow porcupines"	: 159
Dec. 28-Jan. 16*	20	"moose, two beavers, second moose" (+ recovery of buried meat)	: 161 : 163 : 175,177
Jan. 29-Feb. 9	20	"we always had something to eat... and in so small quanties"	: 179,181
		"we scoured the plain"	: 183
Feb. 14,15	20	"two small moose and a larger one"	: 183
March 6	20	"we shifted our quarters a number of beaver lodges found"	: 185

(*deaths reported January 6)

TABLE II: ANALYSIS OF FOODS CONSUMED ACCORDING TO TABLE I

Compiled from: H.A. Feit - personal communication
W.B. Kemp - personal communication
Cleland 1966 Table 6

SAMPLE DATES FAUNA SAMPLES	DAYS	LIVE WEIGHT	TOTAL WEIGHT	PERCENT USEABLE	TOTAL POUNDS	POUNDS PER PERSON	CALORIES PER POUND	TOTAL CALORIES PER PERSON	CALORIES PER DAY
Dec. 24 - 27	4								
3 porcupines		15	45	70	30	1.5	650	975	244
1 hare		3	3	50	1.5	.07	675	50	12.5
5 beaver (?)		45	225	70	158	8	750	6000	1500
									1756.5
Dec. 28 - Jan. 16	20								
2 moose		700	1400	50	700	35	600	21000	1050
2 beaver		45	90	70	63	3	750	2250	111
									1161
Feb. 14 - Mar. 6	22								
3 moose		700	2100	50	1050	53	600	31800	1445
									1445
							Group membership:		20
							Average caloric intake per total days:		1454

values also vary according to the part of the animal eaten. Moreover, not all days were eating days — December 25th in our 4-day sample "was for us a day of fasting" (JR VII:145), and this not for religious reasons. The span from November 20th to December 23rd seems to have been the most critical time. The derived average intake of 1,454 calories may also be somewhat misleading — the "Eat-all Feast" that took place when the hunt was successful meant a higher intake for a day or so followed by a rapid decline. The Montagnais may thus have been able to approach their required intake, but only for a short time.

It is not unreasonable to assume that the daily caloric intake throughout the winter was never more than one-third of what was actually required. Champlain's (II:53-54) description is vivid enough — "On the twentieth of the month of February they came.. so thin and emaciated that they looked like skeletons, most of them being unable to stand". That the Montagnais suffered from malnutrition is uncertain, but that they were undernourished is beyond doubt.

AN EVALUATION OF THE MONTAGNAIS HUNTING ECONOMY

The discussion will now focus on an evaluation of the Montagnais hunting economy, both in terms of how "aboriginal" it was and the extent to which it was altered by trading incentives. Major sources for the ethnology of the area all derive from a period when the influence of the fur trade was already at least seventy years old (Hoffman 1961:202), and for the southern Montagnais, face-to-face contact began around 1550 AD, more than 200 years earlier than it did for Athabaskan groups of the farthest Northwest (Leacock and Lurie 1971:349).

Rappaport (1969:184) had suggested that ecological anthropology would do well to follow leads indicated in animal ecology. It is well known that most animal populations are in equilibrium with their resources. Similarly, by virtue of their positions within the trophic-dynamic structure, human populations are inevitably bound by the laws controlling the flow of energy, and their long term demands that they do not over-exploit their staple resources. In other words, there is a tendency towards equi-

librium guarding the survival or regenerative capacities of these resources.

This tendency towards equilibrium might well be expressed through the *seasonal* hunting of certain animals. Moose, for example, should be left alone in summer so that the young born in spring may help to maintain the number balance for the winter; a breach of this practice might jeopardize the supply. This is, in effect, natural conservation, which appears in this case not only to coincide with the principle of least effort, but with the maximum food value of the animal as well. Beaver meat, however, is of maximum food value the year-round (Feit — pers. comm.), so that beaver hunting in the winter coincides only with the principle of least effort. The beaver was the object upon which the trade focused, hence any statement regarding conservation will have to be carefully assessed. Consider the following: (1608) "At that time when their eels and other things which they dry are prepared, they go off beaver hunting and remain away until the beginning of January" (Champlain II:45); (1632) "The sixth of August.. one of them approached me and said.. that they were going hunting or fishing for beavers.. that they would return when the leaves fell from the trees" (JR V:59) "In the spring the tent group Le Jeune was with split up.. some members keeping to the highlands to hunt moose and the others following the stream beds where the beavers were to be found" (Leacock 1954:15); and (1634) finally, "Beaver was eaten in all seasons" (JR VI:305).

If the principle of least effort is employed as an analytic tool, Champlain's observation may be interpreted as the one illustrating the aboriginal custom. The termination of beaver hunting would coincide with the time when conditions were at their best for moose hunting, that is, in early January (Feit 1973:118), but beaver could of course be relied upon when other resources are scarce. The other references clearly indicate the influence of the fur trade. It is suggested that beaver was hunted in August in order to trade the pelts to obtain food-stuffs and equipment for the coming winter. The same explanation seems applicable to the spring hunt — supplies may have been needed to tie the bands over until the appearance of valuable schools of fish at the end of the summer. Since beavers give birth to their young in early spring, hunting at that time or shortly thereafter jeopardizes the supply.

Le Jeune (JR VIII:57) stated that "when the savages find a lodge of them (beavers), they kill all, great and small, male and female. There is a danger that they will exterminate the species in this region". Leacock (1954:3) claimed that "aboriginality of conservation" was denied when Le Jeune made this statement. On the contrary, this violation of the natural equilibrium may well have been a reaction to trade incentives. As the Indians themselves remarked, "The beaver does everything well, it makes kettles, hatchets, knives, bread, in short, it makes everything" (JR VI:297). If Montagnais survival depended upon the preservation and regenerative capacities of resources as pointed out earlier, accounts that contradict this indicate how distorted the aboriginal way of life had become.

To correlate Montagnais hunting dynamics further with the propositions of animal ecology, statements claiming that "conservation implies a drive toward settling down" must be rejected (Leacock 1954:3). Limited movement is *not* essential to a system for conserving game, for as Lee and Devore (1968:12) have pointed out, "groups do not ordinarily maintain exclusive rights to resources. Variations in food supply from region to region and from year to year create a fluid situation that can best be met by flexible organizations to allow people to move from one area to another". It would be a misconception to believe that, because of the fur trade, the Montagnais changed their tradition of family or group land holding to individual holdings (Patterson 1972:66). High frequencies of moves, among other things, could not possibly have fostered land holding of any kind.

Another reason why limited movement is not necessary to a system of conserving game is that while the hunter will move on when certain yields have reached a "low", it is unlikely that the hunter's "low" coincides with the "too low" density of the animals (Paine 1973:303). The hunter moves on primarily because of the principle of least effort as was seen. According to Paine, the hunter's yield will merely reduce the species population to somewhat below its ceiling level, and the population subsequently will enter a period of fast growth. In the face of starvation, however, the hunter may linger and any conservationist tendencies arising from moving on when the yields are low may break down. This of course depends on how plentiful the other resources are.

Concerning between-season shifting, Jenness (1932:46) has pointed out that "the seasonal character of the food supply... compelled the various bands to move from one hunting ground to another *as soon as the first began to slacken in its yield*" (italics mine).

Thus, conservation *was* aboriginal and is not merely a questionable inference as Leacock claimed (1954:3). Only later did it develop into individual or family territories and into "farming" or husbandry as Speck and Eiseley (1942:241) consider conservation to be. While Leacock (1954:2-4) rejected Speck's theory of the *aboriginality* of the hunting territory, her rejection was not well substantiated. Suggesting that small game was not of sufficient importance in the first place because Le Jeune's group all but starved on beaver until large game animals were brought down, Leacock failed to realize that the beaver was already depleted by the 1620's (Feit — pers. comm.). Husbandry was necessitated because of this. While Speck and Eiseley's theory was founded on the notion of pre-contact population pressure, Leacock maintained that if such pressure was not observed soon after the invasion of the whites, it is doubful if it was felt before contact. Pressure that might have existed after the arrival of the whites was attributed by Leacock to the Iroquois. A prevailing state of war severely restricted travel for hunting: "The fear that they have of their enemies prevents their going to the hunt so that their lives may be sustained" (JR XX:261). The situation appears to have been serious: "Other resolved.. to reach the woods to the south.. saying that they would sooner die by the fire of the Iroquois as by hunger.." (JR XXV:107). The white population of New France in 1627 was only 107 people, of whom 20 were permanent settlers (Trudel 1973:165); by 1640 this figure had risen to only 270 (Ibid: 257). Effects of population pressure were therefore minimal, and it was the French who attributed the scarcity of game to the Indians, "who, in the pursuit of them, have driven these animals from our settlements" (JR IX:165). There were some, however, who held a different opinion: "Game among river birds is abundant in season.. but it has been so greatly disturbed in the more inhabited localities, it is going farther and farther away" (JR IX:165). Over-kill, practiced by Indians and whites alike, also appears to have contributed much to the misery suffered by all, for in 1638 "they will go 2 or 3 hundred leagues (600-900 miles) into the

woods to find game.." (JR XV:183). The situation was somewhat alleviated in later decades, for there occurred a marked decrease of Indian pressure on resources as Indian populations were decimated. "Formerly, the hunting of them (moose) appeared to our Frenchmen an impossibility, and now it serves them as recreation" (1659; JR XLV:195).

The hunting territory may also have been encouraged to develop because the seasonal cross-over had become a much more critical time due in part to growing dependance upon extra-cultural "aid". Just as the Dogrib Indians of northwestern sub-arctic Canada "can go to the fort and throw themselves at the mercy of government welfare" when their system cannot support them (Lee 1969:78), so the Montagnais "came to our settlement (February 20) so thin and emaciated" (Champlain II:54). The French may have offered aid out of sheer benevolence, or as a means of converting the Indians, or simply keeping them alive to hunt for furs. Yet the situation was made clear when Le Jeune (JR VIII:75-77) was told that "You do not know these people here; all they do is for the belly, they do not care for you, but for your food". Dependance upon French aid may have discouraged extensive preservation of food although the documentary evidence suggests that preparations for the winter included the preservation of food. Le Jeune (JR VI:277, 313) remarked that moose meat, obtained in the winter, was eaten until the month of September, and that smoked eels, prepared in October, were eaten until January. Champlain (II:44) noted that the supply of eels lasted until February, when the snow was two and a half or three feet deep at the most. Only with the advent of the trade did the Montagnais "often fast inspite of themselves, as they did also in the Months of December and January" (JR LXIII:253,255).

These instances demonstrate a former subsistence strategy designed to bridge the so-called critical seasons (fall/spring) and to alleviate stress until circumstances permitted a fuller exploitation of the resources of the season. Champlain's reference to the depth of the snow above suggests that it may not always have been favourable; hence the value of preserved food. That the Indians returned to the settlement on February 20th indicates that circumstances were now beyond their control — their preserved supplies were meant for only a limited period. Thus, the presence

of the French may have encouraged the Indians to abandon preservation altogether. Table I indicates how much preserving was actually done — practically nothing. The fact that the group began to suffer seriously by the end of November can be contrasted with former times, when January and February were months that determined the outcome of the winter. All of this, moreover, contradicts what Leacock (1954:7) had maintained, that "they could not preserve, store, or transport food to any significant extent", and that "occasionally there was surplus meat to be dried and kept, but it merely filled in temporarily when hunting was poor, and could not be depended upon for any length of time".

CONCLUSIONS

In conclusion, one must consider how much aboriginal Montagnais hunting dynamics were influenced by the fur trade. It is suggested that a radical depletion of game was felt as early as the second decade of the 17th century. The moose seems to have been an exception, as reports indicate its abundance throughout the 17th century. Though the famine of 1633-34 came to an end towards the latter part of the winter when conditions warranted successful hunting, the abundance of moose in later decades can be attributed to the decimation of Indian populations and a concomitant reduction of pressure upon the resources by them.

The situation appears to have been most urgent during the early part of the winter, when such animals as the beaver would ordinarily have been sought. This depletion of game, together with the effects of adverse conditions, widened the gap between input and output even more. Since beaver is normally thought of as a stable resource, only its depletion can account for hardships encountered. While it may be argued that snow and weather conditions were less than desirable in the first place, such would not seriously affect the availability of the non-migratory beaver. It is also not possible to determine if depletion and bad conditions also coincided with a general fluctuation of the species population. Perhaps there would have been more fatalities had this been the case.

The struggle for survival was further complicated by the fact that little food was any longer preserved. Had the practice con-

tinued as in aboriginal times, and had there been no depletion of game, starvation may have been unheard of, though undernutrition would probably have prevailed. In consequence, lack of preservation, depletion of game, and unfavourable hunting conditions rendered the principle of least effort relatively inoperative, and with it any proclivity towards conservation. Hunting beaver in the spring may have endangered their regenerative capacities or reduced their numbers, as did hunting when it did not coincide with the principle of least effort used in the pursuit of other game. Thus, these developments completely altered the aboriginal way of life and eventually precipitated the hunting territory. This was one alternative which lessened the danger of complete extinction of the various animals, fur-bearing or otherwise, and perhaps saved the Indian from total cultural annihilation as well.

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