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EPIDEMIC EFFECTS AS CAUSES OF WARFARE
IN THE NORTHEAST AFTER 1640

by

© Susan Marie Johnston, B.A.

A thesis submitted to the Faculty of
Graduate Studies in partial fulfillment
of the requirements for the degree of
Master of Arts

Department of Sociology and Anthropology

Carleton University

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ABSTRACT

The effects of virgin soil epidemics experienced by Huron and neighbouring groups are investigated. The spread, duration, incidence and mortality of each epidemic are estimated. Huron depopulation by disease between 1634 and 1640 is estimated by using known mortality rates elsewhere and is found to coincide with seventeenth-century estimates and to exceed most current ones. The effects of epidemics on behavior are traced. Analysis of warfare in the northeast in the 1640's indicates that in some groups captures increased and more captives were kept alive than previously. This increased group size, and corresponds to post-epidemic attempts to restore population elsewhere. In the northeast, this contributed to increased incidence and destructiveness of warfare, as did responses to other epidemic effects, such as famine. Analyses of the disease experience, interpretations of it and perceived needs following it are deemed essential to the interpretation of post-epidemic events.

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PREFACE

My interest in the Huron stems from a fascination with the Jesuit Relations from the Huron missions and the desire to apply anthropology to historical and archaeological data in the northeast (here considered as the Ontario, New York State and Quebec regions).

The purpose initially was to investigate the early trade period in Huronia and elsewhere, e.g., East Africa, in the hope of illuminating Huron studies through general propositions arrived at through ethnographic analogy. Further perusal of the Relations, however, soon resulted in awareness that existing explanations of Huron behavior based on trade motivations were inadequate. I concluded that events in Huronia in the 1630's and early 1640's couldn't be understood without consideration of the effects of epidemic disease. This developed out of 1) my growing awareness of the importance to the Huron and other groups of the epidemics and their effects as experienced by them, and 2) ideas recently provided by similar investigations elsewhere.

I address the main historical problem in the northeast during the mid-seventeenth century: the increase in warfare after 1640. This is usually

explained in terms of trade. I will argue that warfare increased because of epidemic effects. A description of the epidemics is followed by an analysis of how they were experienced. As the majority of the data come from the Huron, it is their experience which is described. Although the presence of Jesuits in Huronia during the epidemics may have made their experience somewhat unique, data on other groups's responses suggest that the Huron case was fairly representative.

The examination of Huron and other groups' perceptions of the epidemics and of the problems created by them suggests motivations leading to increased warfare. Analysis of the warfare supports the proposition that at least some of it resulted from epidemic effects. I tested the hypothesis that loss of numbers motivated groups to augment their size by increasing captures, which increased warfare. Other epidemic-related motivations are suggested.

The epidemics described are mainly those of the Huron and the warfare mainly that of the Iroquois. This is a function of observer location: the Jesuits were in Huronia and at the St. Lawrence, and observed both epidemics and warfare from there. Thus Iroquois epidemics and effects of warfare by Huron, Algonkin and allied groups are comparatively sparsely reported.

However, the focus is the northeast; although the data are limited, those examples are considered representative of all groups, unless there is evidence to the contrary.

CHAPTER 1

REVIEW OF THE LITERATURE

Around 1640 warfare between the Iroquois confederacy and Algonkin, Montagnais and other Iroquoian groups¹ increased in frequency and intensity. Within 15 years many groups had dispersed following deaths, captures and the resultant weakening of their defenses against the Iroquois. Various explanations of this increase in warfare have been proposed.

Early explanations cited Iroquois nature and superior organization. The Iroquois demonstrated a "insensate fury" and an "audacious pride and insatiable rage for conquest" (Parkman, 1900, 2: 274, 262). They possessed a superiority of intellect and tribal organization from which came a "universal spirit of aggression; a thirst for military glory and political aggrandizement" (Morgan, 1966: 8).

Hunt rejects a superior Iroquois organization as the reason for increased warfare. Instead, the cause must be found, he believes, in "a general condition of Indian life, readily ascertained and recognized, from which the motivation of the Iroquois should appear to proceed inevitably" (Hunt 1940: 10).

¹Group names are those used by Trigger (1976: xxiii): "In keeping with internationally accepted usage, the term Iroquois refers only to the confederated Five Nations of upper New York State; the Mohawk, Oneida, Onondaga, Cayuga, and Seneca. The term Iroquoian is reserved for the broader linguistic grouping to which they, the Huron, and many other tribes belonged. Likewise, Algonkin refers specifically to the tribal grouping that inhabited the Ottawa Valley and adjacent regions early in the seventeenth century, while Algonkian refers to a more widespread linguistic grouping to which the Algonkin belonged."

Since their ascendance coincided with the spread of European trade, he infers they were related.

The European trade "permitted the constant participation of every native, expanded the business of trade to unprecedented proportions, and changed, almost overnight, the fundamental conditions of aboriginal economy ... old institutions and economics had profoundly altered or disappeared completely at the electrifying touch of the white man's trade.... The great desirability of the trade goods to the Indian who had once known them became shortly a necessity, a very urgent necessity that permitted no renunciation of the trade " (Hunt 1640: 4-5). The persistence of the Iroquois in acquiring western furs resulted from this dependence on European goods which, if it "had become a social and economic necessity to them, their position had life and death as alternatives" (Hunt 1940: 11). He concludes: "The European trade was the major circumstance of all inter-tribal relations in the Great Lakes area, and the Iroquois and all their works were phenomena of that contact" (Hunt 1940: 161).

Most scholars have accepted Hunt's notion that Iroquoian war changed because a new, economic motive had been added to the situation (e.g., Wallace, 1970; Trelease 1960; Hadlock, 1947; Heidenreich, 1971; Snyderman, 1948; Tooker, 1963; Trigger, 1976; Fenton, 1971). The Iroquois are said to have been dependent on European trade goods because a) they needed to have metal weapons and guns (Hunt, 1940; Trigger, 1976; Tooker, 1963), and because b) they needed other tools of European manufacture, as men

had less time to produce them (Trigger, 1976), because the skills to make the native equivalents were being lost through lack of practice (Hunt, 1940), or as increased productivity was necessary to grow enough corn to get enough furs to maintain the trade (Fenton, 1971).

When peaceful attempts (i.e., treaty negotiations) to acquire western beaver failed, the Iroquois fought to get them. They attacked to steal furs or goods (Fenton, 1971; Tooker, 1963; Trelease, 1960) or to force the Huron to trade with them (Hunt, 1940). Finally they decided to destroy Huronia to replace the Huron as middlemen in the fur trade (Hunt, 1940; Goldstein, 1969; Tooker, 1963) or to get new hunting territories and a clear field to raid Algonkin groups north and west of Huronia (Trigger, 1976).

Hunt believes the economic motive is the only motivation; lacking it, the causes are "mysterious" (p. 5). Trigger believes the contrast between traditional and 1640's warfare demonstrates the new motivation. Traditionally, in his view, warfare involved killing and captures of individuals and sieges of villages were only to draw out warriors with whom to fight: motivations were only blood revenge and individual aspirations for prestige. The only known destruction of villages and dispersals of groups (e.g., the hypothesized attacks on Hochelaga) occurred in the context of European trade. He states that "In traditional warfare, the aim was to preserve one's enemy as a group in order to be able to go on fighting with them indefinitely" (Trigger, 1976; 227). A different type of warfare reflected

trade needs, e.g., the Huron-western Iroquois warfare in the 1640's: the destruction of a Huron village by the Iroquois in 1642 was motivated by the desire for furs, as were probably many of the small attacks which increased around that time.

Trelease believes that several factors were involved in Iroquois warfare. He accepts that economic factors operated after 1640, but he stresses the equal importance of traditional causes and perhaps a desire to expand the league to achieve peace. Beyond these, he thinks their aims "uncertain" (p. 120).

Wallace's (1970) explanation is based on the assumption that the blood feud by its very nature involves increasing levels of violence. Successive killings and revenge involve more and more people through time, until some sort of resolution--decisive battles or treaties--is required. He suggests that the local abolition of blood revenge, achieved through the league formation, increased the ardor and frequency of attacks on other groups, which increased bloodshed and numbers of antagonists until the travel distance to unconquered groups became great enough--500 miles--to decrease instances of violence (which happened by 1750). Wallace adds that part of the increasing level of violence following the formation of the league was due to the need to replace with enemy captives men killed in war. Others have noted the strengthening of Iroquois groups through adoption of captives (Fenton, 1971), and that adoption was one of the traditional motives for warfare (Snyderman 1948). However, no one has attributed increased warfare to the desire to

adopt captives. Except for Wallace, population increases due to the incorporation of captives are viewed as the consequence, rather than the cause, of war.

Schlesier (1976) suggests that warfare increased because of epidemic disease: the Iroquois raided the French and their allies in retaliation for the sufferings introduced by the French. Even the dispersals, he believes, represented flight from disease rather than from Iroquois.

Given (1978) challenges the economic explanation not by offering an alternative but by demonstrating the inferiority of French arquebuses to native weapons, thus arguing against a perceived necessity for and competition to get guns. He also suggests that the trade-dependency existing in the 18th century has mistakenly been projected back to the 17th century.

Analysts have thus varied in attributing cause to the increased warfare. Causes include:

1. Changed motivation
 - a) wanting European goods, or furs to get them
 - b) wanting peace and an extension of the league
 - c) wanting revenge for epidemics
2. Changed techniques
 - a) increased unity and cooperative action resulting from the formation of the league
 - b) use of guns and metal weapons

However, the economic explanation, based on trade dependency, remains the most widely held. It has been assumed in discussions of warfare generally (Service, 1968) and sometimes

forms the basis for interpretation of new data, such as the archaeological interpretations of Ramsden (1978) and Hayden (1978) which extend the economic motivation back in time to explain the size of proto-contact Huron sites.

Thus, although traditional blood-feud motivations are deemed important, most attribute the change in warfare after 1640 to economic factors.

Discussion

Trade dependence seems to be inferred from the following:

- volume of trade
- desire for European goods
- desire for guns
- robbery during warfare
- the increase in warfare followed the decrease in trade at Hudson River posts around 1640.

The first three facts do not prove trade dependence, and the fourth was not a new practice. That beaver supplies had diminished is inferred from the drop in trade, but other factors could have decreased or interrupted the flow of furs.

Trigger contends that the scale and frequency of attacks on Huronia were motivated by desire for goods. This is not supported by examining the gains resulting from these attacks. Although the destruction of the village afforded them some spoils, the continual attacks on women and children in fields, or work parties outside villages resulted in killings and captures, not goods.

Trigger's characterization of traditional warfare - that it precludes destruction of villages and dispersals of enemy groups - is questionable. In groups practicing the blood feud, the hatred of the enemy which permeates almost all areas of life and the fact that men are judged according to success in killing and torturing warriors and capturing their dependents perpetuates the institution and precludes limitation to damage which could be inflicted upon enemy groups. If advantages permit, destruction of the enemy as an entity would seem the logical outcome, considering the cultural motivations. The literature indicates that annihilation and increased scope of warfare occur where conditions permit (Vayda, 1976; Cook, 1973).

In the northeast, the archaeological record indicates that destruction of settlements, dispersal and/or relocations of groups occurred before contact, even perhaps as early as 1300 (Wright, 1966). Iroquoian settlements in south-eastern Ontario, uninhabited at contact and dated around 1500, may represent sites of groups who later moved north and north-east to the Huron area, because of Iroquois raiding (Trigger, 1976).

Indian statements to early French observers indicate warfare as the reason for dispersals and relocations. Champlain learned in 1615 in the Trent Valley that "all these regions in time past were inhabited by savages, who have since been compelled to abandon them out of fear of their enemies" (Biggar, 1922-36, 3: 59). Indians also said that areas near Lake Champlain and on Montreal Island had been abandoned because of enemy pressure (Biggar, 1922-36).

Thus destruction or removal of groups can result from blood-feud warfare, and probably occurred before dependence on or even presence of European trade in the northeast.

In sum, warfare increased in intensity and effects after 1640, but trade dependence and dwindling beaver supplies (creating competition for resources) have not been demonstrated. Much of the Iroquois warfare in Huronia in the 1640's produced no furs, and thus robbery was not their major motivation. Lastly, no new, competitive factor is required for the destruction of settlements and dispersals of groups.

Trade occurred and changes resulted, but another European import--epidemic diseases--was affecting groups profoundly. The fact that warfare increased in the 1640's, following almost a decade of epidemics of unprecedented types, duration and damage, throughout the northeast, suggests that the disease factor warrants investigation.

CHAPTER TWO

VIRGIN SOIL EPIDEMICS

Trade-oriented explanations of post-contact behavior and change in Iroquoian studies are paralleled elsewhere, e.g., in East African studies. However, virgin soil epidemics - another contact phenomenon - are now receiving attention from historians and anthropologists. These epidemics result from the introduction of infectious diseases to populations with no previous immunity. The impact on people experiencing them - the perceptions of and the meanings attached to these experiences - and their effects are being investigated. Health factors and their effects on behavior and events are receiving attention from anthropologists (e.g., Cawte, 1978) and historians (McNeil, 1976; Gallagher, 1977). Langer (1958) calls upon historians to recognize the importance of often-ignored health considerations to history. McNeil (1976: 5) proposes that we "bring the history of infectious diseases into the realm of political explanation by showing how varying patterns of disease circulation have affected human affairs".

The importance of virgin soil epidemics in explanation derives not only from population loss but also from their perceived meanings and the problems thus created for survivors and their attempts to solve them.

Epidemic diseases introduced into North America from Europe, which caused virgin soil epidemics of smallpox, tuberculosis, measles, typhus, dysentery, syphilis, cholera, whooping cough, malaria, mumps and chicken pox (Cook, 1973; Ewers, 1973;

McNeill, 1976) killed the majority of American Indians between contact and the 19th century. Following 30 epidemics in the Texas area an estimated 75 percent of the population died (some from other causes) (Ewers, 1973). Between 1700 and 1780 there was a 90 percent depopulation on the lower peninsula of California (McNeill, 1976), and in one century an 80 percent depopulation of Nantucket and Martha's Vineyard (Cook, 1973). Between half and two-thirds of many plains tribes died in single epidemics, and over 90 percent of the horticultural Mandan died in one smallpox epidemic (Crosby, 1976; Ewers, 1973).

In Greenland, native habitations within 40 miles of the European settlement were deserted two years after the introduction of smallpox (Stearne and Stearne, 1945). An estimated two-thirds of the population of Haiti died within three years of conquest (Stearne and Stearne, 1945).

Early observers in New England noted that epidemic mortality seemed much higher among natives than Europeans (Hutchinson, 1765, in Heagerty, 1928). In various groups only an estimated 7 percent, 5 percent, 12 percent and 5 percent of original populations remained, although for one group 82 percent did (Cook, 1973). Other factors undoubtedly contributed to the disappearance of population, such as flight of remnants to neighbors or kin or their capture or killing by enemies (e.g., of 30 remaining of a group of 500-600, the neighbors killed 28, Cook, 1973). Figures for virgin soil epidemics for which we have more complete data indicate high mortality rates. On Nantucket in 1763, there were 348 Indians when smallpox broke

out: 8 lived apart and did not get it, 18 were at sea, and 40 lived with the English and none of them died. The rest (282), in their villages, were exposed: 256 (91%) contracted it, and 222 (87%) of these died (Cook, 1973) giving a depopulation rate for the villagers of 79 percent and for all Nantucket Indians of 64 percent.

For modern observed virgin soil epidemics greater morbidity, complications and mortality are reported than for previously exposed populations (e.g., Neel et al., 1970; Crosby, 1976; Stearne and Stearne, 1945). For example, modern influenza incidence is usually 10-20 percent, although 40-50 percent rates also occur; but where there is no immunity, rates are higher (Douglas and Betts, 1972). In epidemics among South American and Arctic natives, incidence was 100 percent (Crosby, 1976; Taylor and Knowelden, 1964).

In a modern smallpox epidemic among well-housed people receiving basic nursing, there would generally be 50 percent incidence among the exposed and case mortality rates of between 25 and 50 percent (Dixon, 1962; Benenson, 1972; Millar, 1977), or 12-25 percent depopulation. In Iceland a two-year eighteenth-century smallpox epidemic exhibited 85-95 percent incidence but only a 26 percent case mortality rate (or less than 25 percent depopulation) (Roberts, 1978).

Debate continues over the cause for the greater severity and the relatively high morbidity and mortality rates characteristic of virgin soil epidemics. Some researchers suspect

differences in susceptibility to viruses (Black et al., 1976), but others suggest that other factors account for it.

Factors Affecting Severity of Virgin Soil Epidemics

Many are sick at once, especially if the incubation period is short and/or if living patterns render rapid widespread infection probable. Only a few may be well enough to provide water, food and heat if necessary. Exposure and malnutrition thus add to the fatalities (Cook, 1973).

In a nineteenth-century measles epidemic on Fiji:

Excessive mortality resulted from terror at the mysterious seizure, and want of the commonest aids during illness; there were none to offer drink during the fever, no food on its subsidence. Thousands were carried off for want of nourishment and care as well as by dysentery and congestion of the lungs. We need invoke no special susceptibility of race or peculiarity of constitution to explain the great mortality (Squires, 1882, in Neel et al, 1970: 418).

In a 1634 Connecticut smallpox epidemic:

The condition of this people was so lamentable, and they fell down so generally of this disease, as they were (in the end) not able to help one another; no, not to make a fire, nor to fetch a little water to drink, nor any to bury the dead; but would strive as long as they could, and when they could procure no other means to make fire, they would burn the wooden trays and dishes they ate their meat in, and their very bows and arrows; and some would crawl out on all fours to get a little water, and some times die by the way, and not be able to get in again (Bradford, 1964: 313-314).

Transmission of infection in virgin soil epidemics is high because of mobility. For example, during a Yanomama measles epidemic, people visited the sick, left infected areas for home, and abducted diseased women. The disease spread extensively because it occurred at the time of year when people travelled and visited (Neel et al., 1970).

Concurrent and successive epidemics increase mortalities. In Texas, it is estimated that concurrent epidemics occurred in 1739 (measles and smallpox), 1877 (measles and fever), 1882 (whooping cough and malarial fever) and 1892 (measles, influenza and whooping cough) (Ewers, 1973). Series of epidemics have been observed in this century: malaria and pneumonia among the Yanamama and tuberculosis and influenza among Ungava Bay Indians were followed by measles and then bronchopneumonia, resulting in many deaths (Crosby, 1976). Not only would physically-debilitated populations offer less resistance to infection, but successive epidemics may have increased fatalism and thus decreased care of the ill.

Settlement pattern affects transmission. The greatest population losses of the 18th and 19th century in Texas occurred among the horticultural Caddoans who "lived in compact semi-permanent villages of multi-family lodges, where conditions were as favorable for the rapid communication of diseases as they were in the mission compounds" (Ewers, 1973, p. 111). The more nomadic groups, who dispersed when epidemics struck, and the missionized Indians who left the missions, probably lost fewer.

Trade--often expanding at contact, just as diseases were introduced (Patterson and Hartwig, 1978; Azevedo, 1978)--spread infection along trade routes, both by face-to-face transmission and by infected goods (Brown, 1968; Heagerty, 1928).

Subsistence and war parties composed of people from different villages or nations infected each other as well as people encountered. In 1690 Mohegan and English soldiers infected

Iroquois warriors during a joint expedition: subsequently, 400 died in Iroquois villages (Stearne and Stearne, 1945). In 1750 a party of 100 Chippewa warriors got smallpox at the St. Lawrence, and a few survived long enough to reach home and infect people there (Heagerty, 1928). The spoils of war also spread infection to victors' groups (Thompson, 1916).

Panic flight can prevent infection or spread it. A few Chippewa at Fond du Lac who did not die in an epidemic fled to neighbouring groups: in one, all but one child contracted it (Heagerty, 1928).

Lack of care can be serious. The very young are particularly vulnerable, being dependent on care by others and on mothers milk for the first two or three years (Crosby, 1976). Nourishment may be lacking due to inability to carry out subsistence activities, as described above, and starvation would increase in closely succeeding epidemics, as food scarcity increased.

Comparisons of mortality rates between groups receiving and not receiving medical care (this often consisting only of providing food, drink, shelter and washing) indicate the difference it can make:

a) In a 1954 measles epidemic in Brazil, case fatality was 9.6 percent among those receiving care, and 26.8 percent among the rest (Crosby, 1976).

b) In an 1898 smallpox epidemic among the Pueblo, the figures were 10 percent and 74 percent (Stearne and Stearne, 1945).

Just washing would presumably have lessened the suffering, morbidity and mortality of the Connecticut Indians:

This spring, also, those Indians that lived aboute their trading house there fell sick of the small poxe, and dyed most miserable; for a sorer disease cannot befall them; they fear it more then the plague; for usually they that have this disease have them in abundance, and for wante of bedding and linning and other helps, they fall into a lamentable condition, as they lye on their hardmatts, the poxe breaking and mattering, and runing one into another, their skin cleaving (by reason therof) to the matts they lye on; when they turne them, a whole side will flea of at once, (as it were) and they will be all of a gore blood, most fearfull to behold; and then being very sore, what with could and other distempers, they dye like rotten sheep (Bradford, 1964, p. 312-313).

Traditional cures, although reassuring, often have involved lack of rest, dieting, fasting or exposure. For example, the Cheyenne and Arapahoe took sweats and then plunged into icy water, which was described by an observer as usually fatal for measles (Ewers, 1973). (Cooling was a 17th-century treatment for smallpox which often killed the patient (Dixon, 1962)).

What observers have called fatalism can result in lack of care. During a measles epidemic at Ungava Bay, "a fatalistic attitude toward the disease caused the loss of several entire families, whose members would not help each other or themselves" (Crosby, 1976: 297). Among the Yanomama, when whole families were ill, not only were they sometimes unable to nurse one another, but they failed to nurse when they could: some lay in their hammocks and appeared to be just waiting to die (Neel et al., 1970).

Fear and terror must also be considered in assessing

effects of virgin soil epidemics. Suicides--sometimes mass--are reported for people fearful of experiencing the scarring or suffering caused by smallpox (Crosby, 1976; Thwaites, 1959, 18: 29; 19: 17).

Stress may result from political and social insecurities--such as the collapse of family institutions--following epidemic depopulation. It has been suggested that psychological stress affecting dislocated and underfed populations may even decrease resistance to infection, thus increasing vulnerability to successive epidemics (Patterson and Hartwig, 1978).

Debilitation of patients, such as that resulting from virgin soil epidemic conditions, and behavior increases the severity of complications of the primary disease. Complications experienced by debilitated smallpox patients include skin infections and infections of the respiratory tract, such as broncho-pneumonia and pleurisy, which in the past was usually fatal (Dixon, 1962). Less frequent complications, but ones which might have been more common in virgin soil than among treated populations are encephalitis, joint effusions and osteitis (Millar, 1977). In non-virgin soil smallpox epidemics, miscarriages are common in the first three months of pregnancy and the mortality rate is high among pregnant women (50%), partly because of abortion. The rate during virgin soil epidemics, because of other factors, would be expected to be higher.

It has been suggested that if an epidemic were preceded, if nursing care were the same as in European epidemics and if less fatalism were felt, epidemic effects of virgin soil

populations would resemble those of European ones (Neel et al 1970). It appears that virgin soil epidemics incur greater incidence, morbidity and mortality than non-virgin soil epidemics, regardless of possible variation in susceptibility.

Post-epidemic Effects

Some of the changes occurring after virgin soil epidemics now being interpreted as resulting from them include the effects of depopulation itself. For East Africa, Hartwig (1978) suggests that developments previously attributed to long-distance trade or wars may have been influenced by epidemic depopulation around time of contact. Also, he attributes the beginning of the end of Masai prominence to cholera and smallpox epidemics, rather than to war, as others have posited.

Epidemic effects extend beyond depopulation, however. Epidemics affect, and reveal much about, all aspects of a society (Rosenberg, 1966). "An epidemic is a time of testing for a society's political, economic, social and cultural institutions, so societal responses to epidemics must be examined as well as demographic consequences" (Patterson and Hartwig, 1978, p. 19). "...studies should not stop with efforts to determine the effect of epidemics upon tribal populations: they should encompass efforts to find the influence of epidemics upon the life ways of those Indians who survived those epidemics" (Ewers, 1973, p. 113), as those ways were affected by the epidemics (Washburn, 1975).

Epidemic-caused changes for the Kerebe of East Africa are suggested as: alterations in lineage relationships, an increase

in sorcery accusations, the encouragement of immigration by the chief, and increased captures of slaves. The last two probably resulted from concern over loss of population: slavery was traditional, but after the epidemics a broader range of people were considered potential slaves. Thus some rather "unsavoury" practices of the period are more easily understood in the context of virgin soil epidemics (Hartwig, 1978, p. 43).

Changes in the Texas area which Ewers (1973) suggests may have resulted from epidemics include:

- a) More captures but fewer tortures and sales of captives, who "became more valuable as adopted members of a family - to replace children, wives, and husbands who had been lost in epidemics - than as human sacrifices or human trade goods" (p. 111);
- b) Relaxed marriage rules;
- c) Decreases in 'killings of dead warriors' wives, and dead mothers' infants;
- d) "Repeated combinations and reorganizations (of groups) into fewer and fewer units as their number declined" (p. 112), (which is how the Caddoans survived); and
- e) An increased emphasis on ceremonial behavior to protect against illness.

In addition, concern about relative weakness vis-a-vis traditional enemies, because of epidemic depopulation, may account for the reluctance of the Comanche and Kiowa to permit a census following their series of epidemics. ▽

In sum, epidemics experienced by virgin soil populations

generally result in high rates of incidence, morbidity, and mortality and in fear. Moreover, the epidemic experience influences subsequent behavior and events.

Various epidemics circulated in the northeast in the 1630's and early 1640's (Stearne and Stearne, 1945), most groups suffering successions of them. The determination of how they experienced them, perceived them, and responded to them and to the damages sustained would inform any analysis of behavior and events during and after the epidemics. There follow descriptions:

- a) of the virgin soil epidemics among the Huron;
- b) of the Huron experience of these successive disasters, as perceived, interpreted and evaluated by them; and
- c) of the problems created, as perceived by the Huron.

This will both indicate the importance of the epidemics to them (e.g., where their epidemic-related concerns fit into their scale of priorities) and suggest motivations and behavior which might have resulted.

CHAPTER 3

THE HURON EPIDEMICS

Three Huron epidemics occurred between 1634 and 1640. Not all groups would have experienced and/or perceived the epidemics identically, especially as Jesuit presence and behavior in Huronia affected Huron interpretations. However, the non-Huron data show that many elements of the epidemic experiences and problems created by them were similar among other groups.

The Huron epidemics are described in order to establish (as nearly as the data allow) degrees of incidence, morbidity and mortality of the three epidemics, and to describe the virgin soil epidemic behavior which increased the above rates and greatly exacerbated the damages.

In addition, the extent of Huron depopulation is assessed: previous estimates and their bases are evaluated, and, for comparison, a new estimate is made, using mortality rates for similar infections elsewhere.

Huron perceptions are described in detail, revealing extreme mental distress and fears of ultimate destruction of their social and cultural entity.

Limitations of the Sources

The facts that the Jesuits did not observe everywhere in Huronia and that they usually failed to record data pertinent to our purpose renders the data uneven. During the first epidemic and the early part of the second epidemic they observed only the Bear nation. They travelled throughout Huronia during the third epidemic, but the extent and severity of the earlier

epidemics outside of the Bear nation are unknown.

The Jesuits recorded data concerning lack of nourishment or warmth, lack of care, physical debilitation, family mortality rates, etc. It is uncertain, however, how representative these were. Furthermore, rates of incidence and mortality depend on Jesuit presence or hearsay, and thus tallies of reported rates are much lower than actual rates. This is borne out in the discrepancy between Jesuit reported mortalities and depopulation estimates in 1640.

The Jesuits' main concern was the patients' spiritual rather than physical well-being; physical data and much else are mentioned only in passing.

Bias resulting from political considerations is suspected in the inclusion or exclusion of data in some Jesuit reports and publications. Edited versions of the Relations were published in Europe to increase support and recruits for the missions. It was Jesuit policy to present a positive view of life in the colonies. Unpleasant aspects were omitted from the Relations (Biggar 1965). Thus the Huron disease experience was probably more miserable than depicted and more similar to the Connecticut Indians' experience.

The Three Huron Virgin Soil Epidemics: Extent, Duration, Incidence,

Description and Mortality

The Epidemic of 1634-35

Extent. Brebeuf reported that the epidemic swept through the region from the Montagnais at the St. Lawrence to Huronia.

It seems fair to assume there was some incidence in the three nations other than the Bear Nation, but this is not documented. Traders from Teanaostaiáé, of the Cord Nation, had been at the St. Lawrence the preceding summer; some from the Rock Nation had brought Brebeuf to the Bear Nation (Thwaites, 1959; 8: 71)² and so could have been exposed.

Duration. It lasted from August to the following spring. Although whole villages are described as being sick at once, the inhabitants of the relatively small village of Ihonataria, where the Jesuits lived, suffered throughout. Possibly some houses escaped infection during the height of the epidemic but were eventually stricken, as happened in 1636-37. Survivors were reported to be weak all winter (8: 87-89).

Incidence. Incidence was high: "...the majority of the Montagnais at Three Rivers" and "almost all the traders" contracted it. It "affected almost all the savages" (8: 107). "It has been so universal among Savages of our acquaintance that I do not know if one has escaped its attacks" (8: 87). In Huronia, "whole villages were prostrated" and the sick were "very numerous" (8: 33).

Description. "...this sickness began with a violent fever, which was followed by a sort of measles or smallpox, different however from that common in France, accompanied in several cases by blindness for some days, or by dimness of sight, and terminated at length by diarrhoea..." (8: 89). At the St. Lawrence it was

²Jesuit Relations (Thwaites, 1959) sources cited will hereafter be presented with volume and page numbers only.

described as "a sort of measles, and an oppression of the stomach" (7: 221).

Mortality. Brebeuf reported in May that the epidemic had "carried off many and is still bringing some to the grave" (8: 89). "...very many were destroyed" (11: 9).

The Epidemic of 1636-37

Extent. Le Mercier reported that although the Bear Nation suffered it from autumn, only after the Huron traders left in the spring of 1637 did "the malady, which had heretofore assailed only a few villages" become "everywhere prevalent" - a "universal contagion" (15: 13, 19). Winter incidence in the other Huron nations is unknown. Traders from Teanaostaiaé had been at the St. Lawrence the preceding summer, and had delivered a Frenchman to Ihonataria at the beginning of the epidemic there (13: 125); however, there was no mention by the Jesuits of disease in March when they visited Teanaostaiaé, and Ekhiondastsaan of the Cord nation did not yet have it (14: 27). The Huron accusation in 1637 that the Jesuits ruined the part of the country they first came to and were now proceeding to other parts to ruin them also (17: 115) suggests that the disease in summer of 1637 was the first to spread considerably beyond the Bear Nation.

The Nipissing wintering in Huronia were infected by December, the Tionnontaté had "quite numerous sick" in April (14: 33) and the Cheveux-Relevée sought remedies as early as spring (14: 99). In summer, all groups along the route from Huronia to the St. Lawrence were suffering epidemics (12: 197).

Duration. In Huronia the epidemic lasted from early September until the following autumn; secondary infections and recuperations probably lasted into the winter.

Incidence. Ten villages of the Bear Nation are described as having the epidemic from winter until spring, Ihonataria and Ossossane peaking first (in November-December and December-January) and others, such as Andiate, Angoutenc and Onnentisate in late spring and summer (14: 51; 15: 23). In Ihonataria there were probably 50 sick in October and November; the majority of cabins had had it after four months. By the end of June, only one cabin had escaped infection. In Ossossane 50 people were known sick in December and 50 in January (13: 243, 165). In another village, all the cabins had had it by August (15: 43).

After the first case in a cabin, several or many were soon ill (15: 89; 13: 219-223). There are reports of four or five sick at once, and of cabins "full of sick people" (15: 89). In other cabins, illnesses were separated by several months: in a cabin of 20-25 people, of reported illnesses, one was in January, four or five in February and two more in May (13: 255; 14: 59). In another, cases ranged from mid-June to October or November (15: 19).

General descriptions imply that incidence was nearly universal. The French said it "spared hardly anyone" (14: 83). Traders' canoes were "full of sick people"; some turned back before they reached the St. Lawrence, so many in the party were sick (12: 231).

It is possible that trading and other subsistence travel

repeatedly introduced infection to villages. Because of this and because the disease continued for so long after community peaks, it is probable that nearly everyone was infected before it was over.

The Tionnontaté said in late summer that the epidemic was "causing great ravages in their country" (15: 57), and the Cheveux-Relevée sent three different embassies in spring and summer to the Jesuits, asking for a remedy (14: 99; 103).

Description. No rash or respiratory infection is mentioned. A high fever, lack of appetite and weakness was characteristic. There were instances of prostration, unconsciousness, convulsions and nosebleed (13: 87, 89, 195, 187, 249, 253; 14: 31).

An examination of the French experience of the illness in September indicates the variation in incidence and symptoms among them.

The infection was introduced on September 11, when Jogues arrived from the St. Lawrence with a sick French boy. The boy took three weeks to recover, and a domestic who had it en route had a relapse five days after arriving, and took a month to recuperate. The other five cases were as follows:

Jogues: Ill on the 17th. Mild fever for several days, then violent fever every day. Very bad on the 7th day.

Nosebleed for 2-3 days. Fever abated 11 days after onset.

Dominique: Ill on September 23rd. Very bad. Almost died.

Chastellain: Ill on September 28th. "Burning fever", "very restless". Bad until October 7th.

Garnier: Ill at the end of September. Fever not so violent. "Very weak".

Le Mercier: Ill on October 1. Milder. Three attacks,
the second violent.

Three did not contract the infection. All were well by October 15th (113: 89-113).

Case morbidity and mortality for Huron would probably have been more severe, due to the care and feeding of their ill by the French.

Many Huron are described as being unconscious or in a stupor. A child was very restless for 7-8 days, and convulsed nearly all one night (13: 155). A girl "on the point of death" "tossed about like a maniac, incessantly shaking her head" during a particularly noisy curing ceremony; afterwards she was "very quiet", and died the next day (13: 189-191). Of three sick people in one cabin, there was "one neither speaking nor hearing, and the other in almost continual convulsions...and unfortunately there was no one else in the cabin but some children" (13: 195).

It has been suggested that there were two epidemics, since the French suffered the first but not the second, and none of the French at Three Rivers or in Huronia were ill during the summer (Trigger, 1976).

However, Pijart arrived at the St. Lawrence from Huronia in summer "all wasted away, having suffered greatly from fatigue and sickness in the journey", saying "the epidemic prevailed in every direction and that he had about died, since the disease attacked him as well as the others" (12: 197). The facts that Pijart was one of the three Frenchmen who had not had been ill the previous autumn, and that a Huron captain who'd also escaped

infection earlier became ill en route indicates that it could have been the same disease. Cabins in both Ossossane and Ihonataria escaped infection in winter but succumbed in summer (14: 105). The symptoms were the same--fever and prostration. The Jesuits believed it to be the same, noting only that the fever was more often quickly fatal in summer than in winter: "often someone was taken sick and carried away in less than two days" (15: 69).

Nevertheless, there are reports of repeated cases. A woman who recovered after being ill during the epidemic peak "was suddenly taken with a fever, so malignant that she was in the grave in less than 48 hours" (15: 91, 105). This could have been a secondary infection or a new disease. Perhaps the original disease continued, at least until August, but a second, more virulent and quickly-fatal infection occurred concurrently after May.

Mortality. It was noted that "many" and "very many" died (11: 13-15). A trader at the St. Lawrence in the summer of 1637 said "they are all dying in our villages, and along the way" (12: 245). In Ossossane, by December 10th, some were dying every day; on the 20th the illness was still making "great ravages"; and on January 17th it continued "to rage" (13: 185, 197, 235). In summer one man "lost a great many of his relations, and above all the last of his children" (15: 89). By the end of June, "The mortality prevailed everywhere, but especially in the village of Angoutenc" (15: 23).

In Ihonataria--the best-documented village--"most cabins had

a considerable number of deaths" (13: 163) and most of the elders of the village council died by June (13: 161). At the peak of the epidemic a woman's sister, husband and daughter died at one time (13: 135); in another cabin, a mother, child, young man and captain died within six days (13: 221-223). Four of a family died between June and October or November (15: 19). Ihonataria was "almost entirely ruined" (13: 165). Some of the losses in Ihonataria represented dispersal of some people--perhaps out of fear of the French or because many kin had died and thus they moved to be with relatives elsewhere. By 1639, the people of Ihonataria -- "nearly all being scattered or dead from the malady" (17: 11)--were "carried off or scattered by the disease" (17: 59). Other communities may have suffered as much. In August, in another village, there were sick in every cabin; all the captains except one old man had died, and his family was reduced to two (15: 43).

The Nipissing had 70 dead by April, and the epidemic was still serious in their camps in August. The Cheveux-Relevée had 70 dead in one village by June (14: 99).

The Jesuits baptized 250 by June, but not all died. Thirty to forty baptized children had died (14: 107). Even if 200 died, this figure represents only some of the deaths, as the Huron prevented Jesuit entrance to some cabins and villages, thus preventing many baptisms of the dying; and, of course, many others died unknown to the French and/or beyond areas visited by them. In addition, mortality and extent increased after June.

From June 1637 to the end of the epidemic, the Jesuits lived

in Ihonataria and Ossossane and baptized (between spring 1637 and spring 1638) over 100, at least 44 of whom died, including 22 young children. Most of these deaths probably occurred during the last part of the epidemic. However, the Huron thwarted their attempts to seek out the sick, and the Jesuits estimated that 200-300 died without baptism.

1637-1639

There was less illness from the end of the epidemic in 1637 to the summer of 1638, but the Jesuits spent a good deal of their time teaching and helping the sick.

The Wenroronon moved to Huronia in the summer of 1638, while experiencing an epidemic. They were a group originally from the New York or Pennsylvania area who had previously sought the protection of the Neutral, and until 1638 represented the easternmost village of that confederacy. Then, weakened by epidemic deaths and having lost Neutral protection, they sought refuge in Huronia. There were 600, many of them women and children, and many of whom died en route. Those not sick on the way fell ill after arriving. Incidence decreased only after two months (17: 27). A Huron who helped them move was ill for 40 days after he returned, suffering from fever and delirium (17:51). Undoubtedly other Huron were infected as well.

There were no other epidemics in 1638-39, although sick people, deaths and cures are described.

The Jesuits lived in Ossossane and Teanaostaiaé, visited Scanonaenrat for a month, and made short visits elsewhere.

In Teanaostaiaé, there were 49 children and 44 adults in danger of death; 18 children and 26 adults died. In Scanonaenrat a few dying children and old people were baptized.

Once more, however, numbers of baptisms show only a portion of the ill and dying. Hostility toward the French and ascription of disease deaths to their agency was renewed in autumn, perhaps because illness increased as the weather turned colder. The disease in Huronia from 1637-1639--between the epidemics--may represent an endemic stage of the first disease and/or ill health because of weakened constitutions, and prolonged secondary infections, as well as normal incidence and the Wenroronon infection.

The Epidemic of 1639-40

The third epidemic began in the summer: Huron traders contracted the infection from the Kichesipirini, who had reportedly brought it from the Abenakis. All areas of Huronia, as well as the Neutral, the Nipissing, the Tionnontaté, and the St. Lawrence Indians, had it.

Duration. In Huronia it lasted until late winter or spring.

Incidence. This epidemic "spared neither age nor sex", and "put everything into desolation"; the largest village of the Rock Nation became a "woeful hospital" (18: 23; 19: 87; 20: 27). The first victim was carried home from a trading expedition; he died and all in his cabin were infected (19: 89). One cabin had five sick children, and in another all but one child was sick, and he soon contracted it (19: 221). A woman and all her

brothers were sick (19: 265).

Description. The Jesuits say a man "was soon seized with a violent fever, and thereafter the current malady, smallpox" (19: 99). A young man had the disease, recovered, and then became temporarily blind due to an inflammation of the eyes (18: 25).

Secondary or other symptoms were "colic" and, during a long convalescence, sores in several parts of the body accompanied by continual fever (19: 17). One recovered but "remained blind and thin as a skeleton" and died within a few months (19: 199). One woman remained blind, but in another case, blindness was only temporary (18: 27; 20: 23). The "colic", described as severe vomiting, was mentioned by a spirit in a dream, who warned that after the smallpox the French would kill them with colic--perhaps indicating an expectation of secondary infections to follow the disease, as had been experienced in previous epidemics.

Mortality. In two cabins, although nearly all were sick, none or just one died (19: 223, 261). However, mortality "ravaged the whole country" (19: 217). An old woman's two grown daughters and a niece died within three weeks, leaving her with three sick grandchildren, two of whom subsequently died (19: 327). One woman lost all her children, and another three (19: 211, 229). There were "many" dead in one cabin and 11 in another (19: 211). In two families two siblings died at once (19: 227-229). Infants died soon after their mothers (19: 221, 327). The Huron noted that the deaths were mainly among children (19: 211).

The Jesuits baptized 1000 "from among the dying", only 20 of whom were "out of the danger of death" (17: 214). They reported the greatest mortality was among children (18: 23): one hundred children previously baptized died, as well as 360 others who were baptized this year (19: 23; 19: 79).

Presumably mortality was much higher, as there was, again, considerable opposition to baptism. The Jesuits were prevented from entering some cabins and even villages (19: 63, 95, 167, 207, 213).

1640 until Dispersal (1650)

No further epidemics are reported for Huronia, although baptism of the ill and dying continued. It has been suggested that smallpox probably continued, in endemic stages, following epidemics: Cook (1973, p. 493) states that "In New England it became almost endemic among the residue of the native race, and occasionally achieved the magnitude of an epidemic". He estimates a 1.5 percent annual mortality rate from endemic disease in Nantucket and Martha's Vineyard.

Only in 1646 do the Jesuits report that there was no more epidemic disease in Huronia (29: 247).

Factors Affecting Epidemic Severity in Huronia - Transmission,

Environment, Nutrition, Care and Travel

Transmission of Disease

Factors affecting the spread of epidemics generally include the size of the sources of infection, how easily it is transmitted,

the standards of hygiene and the density of population. High density--e.g., in large families, schools, barracks--increase incidence of respiratory disease because of greater likelihood of introduction and greater numbers to be infected. Incidence is greater in cold weather because people spend more time indoors, and thus in closer proximity to infective sources (Taylor and Knowelden, 1964). For example, in a smallpox epidemic in Sheffield, England, chance of infection was 9.7 percent if it was in the community but 75 percent if it was in the home (Dixon, 1962).

Transmission information on smallpox, measles and influenza are given here, not because it is certain that these were the epidemics in Huronia, but because they possibly were.

Smallpox. (Source is Dixon 1962 unless otherwise noted). The major source of infection is the patient, who is infectious from the time he becomes ill until the lesion crusts drop off; however, he is most infectious on the second or third day, and rarely after the 13th day. Infection is spread through respiratory secretions (droplets in the air) in face-to-face contact. It is suspected that the greater the "infecting dose" (p. 311) the worse the case: thus nurses, mothers or family members looking after the sick and people sleeping in the same room have high mortality rates. Chance of infection is greater with increased close contact - such as visiting and overcrowding.

Another, though less common, means of infection is through inhaling virus in the crust (which remains infectious for

months or even years - Benenson, 1972) or in dust in bedding, clothes, animal fur, in the patient's room or that carried by flies and people, who may be passive carriers. The virus can be carried in the nose or throat of people who do not become infected. Infection is common at funerals, because of handling or being near a corpse or shroud and proximity to family members who, if they contracted the disease from the deceased, are at their most infectious. Modern epidemic controls include vaccination of the well, isolation of the sick, control of movements between communities, and general hygiene procedures (e.g., oral and nasal discharges and clothes should be disinfected - Benenson, 1972). The incubation period is 10-11 days.

Influenza is transmitted by respiratory secretions, and, being highly infectious, one person can infect many others. Low humidity and temperature facilitate transmission. Incidence is normally 10-20 percent, but often reaches 40-50 percent and even more in virgin soil epidemics (Douglas and Betts, 1972). In residential schools and barracks it often reaches 80 percent in 10 days (Stuart-Harris, 1979). As the incubation period is only 1-2 days, usually many are sick at once (Gordon and Betts, 1972). Epidemics increase deaths from respiratory and heart diseases (Stuart-Harris, 1979).

Measles is more infectious than smallpox (Millar, 1977). It is spread by respiratory secretions which stay infectious in the air for several hours. It is most infectious when the cough is prominent. Incubation takes 10-14 days (Gershon, 1972).

Transmission in Huronia

Communication of epidemic diseases occurred through both the continuation of normal activities and disease-oriented behavior.

Continuation of normal activities. Trading parties appear to have introduced the three major epidemics. When traders became ill, they attempted to reach home rather than staying where they were. In July 1634, some traders contacted the disease at Three Rivers, and the party left for home. By the time they reached Huronia, those originally sick would no longer have been infectious, but would have infected others: or, others may have been infected at the St. Lawrence and become sick en route, infecting still others of their party and contacted groups. Huron traders from two or three of the four Huron nations were at the St. Lawrence this year.

In 1637, traders going to the St. Lawrence were stricken: some turned back "on account of the prevalence of sickness in their band" (12: 227). Others were sick at the St. Lawrence. "In truth, enough canoes came down; but as they were full of sick people, they did not wish to burden themselves with the clothes or packages of other people" (12: 231).

Trade with neighboring groups undoubtedly spread Huron diseases, e.g., when the Huron traded corn for fish with some Algonkin in 1637 (13: 249). Presumably trips to neighbors before and after St. Lawrence expeditions transmitted disease to and from Huronia, through personal contact and infected goods. The Algonkin at the St. Lawrence suspected this

form of transmission; they believed that northern groups not in contact with the French were becoming depopulated because of French goods which reached them through intermediaries (but believed French powers, not germs, actually transmitted the disease) (11: 199).

War and hunting, and perhaps fishing parties consisted of people from different villages, and expeditions during epidemics would have spread infection in Huronia. At least two references are made to individuals becoming sick while fishing and being carried home (13: 135-137; 15: 73-75). War parties, although usually not active during winter, occurred in spring, and in summer in 1637 and 1640, when epidemics continued in Huronia, and thus afforded transmission between Huron and from Huron to others.

Visits to neighboring groups--the Neutral and Tionnontaté (8: 115), for example--would have continued. Exchanges of individuals also occurred. The Jesuits noted a Huron child living with the Neutral for a time, Neutrals travelling to the Tionnontaté during a famine in winter (20: 49), and Huron visiting the Tionnontaté in spring of 1637 (14: 35). The Tionnontaté visited the Jesuits at least twice in spring and summer of 1637, seeking cures (15: 53; 14: 99).

Huron variation in seasonal activities provided optimum conditions for spread of epidemics. The infections began in summer, when inter-village and -nation travel and contacts were greatest, and dissemination to many villages was most likely. The disease became established just as winter congregation and indoor

activities began, thus ensuring almost universal incidence. (Winter dispersal may have resulted in less incidence among non-horticultural groups--at least those not wintering near the Huron.) Some spread of disease in spring and summer of 1637 was probably caused by Huron travel and by the Nipissing who had wintered in Huronia going to summer camps (14: 37).

Political assemblies offered opportunity for spread of infection. Village councils met daily (10: 213) and sometimes included captains from other villages (13: 233). Nation- and confederation-wide councils met less frequently but undoubtedly spread infection. In 1637, when mortality was greatest, people gathered twice for councils of the Bear Nation, and there was a three-nation general council in August, after which several captains got sick (15: 53).

The Jesuits often gathered villagers together for instruction until Huron hostility prevented them. In July 1637, there was a council in Angoutenc, to which the Jesuits invited not only the captains, but also the old men, women, young people and children (15: 23).

Mortuary practices involved intra- and inter-village contacts, and probably spread infection by way of the corpse and infected family members. After death, the corpse was flexed and wrapped in a robe. Villagers assembled beside him in his longhouse to mourn. The body was not left alone until burial several days later. A group other than the family was responsible for looking after the corpse. On the third day, a feast was held in the longhouse for numerous visitors from other villages.

There was a procession to the cemetery; the body, in a robe on a mat, was carried by four men (10: 269, 271, 273-75; 29: 285; Wrong, 1939: 205, 207-208). Afterwards, women often went to the cemetery to mourn (39: 31).

There is little mention of funeral practices during epidemics, when so many died at once and others were ill. Corpse disposal was probably often delayed until the epidemic waned, at least for those whose duty it was. At the height of the epidemic in Ossossane in 1637, an Arendiwane, as a prescription for the health of the village, advised that bodies should be buried in the ground and not put on platforms in the cemetery until the spring (13: 259). As it was February and the ground presumably frozen, he probably meant burial inside houses. In sum, inter- and intra-village transmission occurred, from corpse, family and others, through usual mourning behavior and also probably by the extended proximity of corpses to longhouse inhabitants during epidemic peaks.

Transmission within the living unit--the longhouse--would have been rapid and incidence high, as described for other horticultural groups. Huron longhouses had eight, ten or twelve fires, and thus sixteen, twenty or twenty-four families before the epidemics (Biggar, 1922-36, vol. 3: 162; Wrong, 1939: 94) and about four or five fires (eight to ten families) by 1638. It is assumed that there were an average of seven people per family (Heidenreich, 1971) and thus longhouse populations of between 112 and 168 for the first epidemic, but fewer in succeeding ones.

There were no partitions between family areas, and thus the house resembled a barrack. In winter, all or most family members would have been present. As soon as someone came down with a disease, others soon followed.

Although the longhouses were drafty, and thus considerably more ventilated than modern dormitories, it is suggested that incidence would have been greater. Communal use of utensils, and probably clothing and robes (sometimes belonging to the deceased) would have increased incidence as well. In Huronia, "without being a great prophet, one could assure oneself that the evil would soon be spread abroad through all these regions: for the Hurons--no matter what plague or contagion they may have--live in the midst of their sick, in the same indifference, and community of all things, as if they were in perfect health. In fact, in a few days, almost all those in the cabin of the deceased found themselves infected; then the evil spread from house to house, from village to village, and finally became scattered throughout the country" (19: 89).

In winter people, sick and well, slept on mats beside the fire--the hub of family activity--and since mortality increases with size of infecting dose, Huron family members must have suffered higher mortality, as do nurses in modern epidemics. Besides resulting in higher incidence and mortality, the lack of quarantine and modern hygiene procedures and housing characteristics led to many being sick at once or in quick succession, as noted by the Jesuits; this would have decreased care of even the simplest kind, as well as nutrition levels and perhaps house

temperatures. Thus timing affected the severity of illness, as it led to lack of nursing, nutrients, and warmth. This was abetted by the fatalism that characterizes epidemics when many are sick at once. Secondary or concurrent infections could also spread rapidly, often before recovery from the first, which meant that severity and mortality would increase in succeeding epidemics.

The practice of enlarging the confederacy by accepting new nations (16: 227) introduced the contagious Wenroronon in 1638, a year otherwise free of epidemics in Huronia (17: 27-31).

There was some precedent for enlarging the Huron confederacy by immigration of new groups, but in this case it may also have been motivated by fears of weakness vis-a-vis their enemies. The Wenroronon arrival was described by the Jesuits as "serving not a little for the defense and preservation of the country" (17: 27). Unlike previous accretions, the Wenroronon dispersed throughout Huronia rather than remaining a discrete nation with its own territory and villages. Absorption into existing settlements was possible because disease deaths and probable regroupings of kin left longhouses sparsely inhabited. The "greater part" of the refugees went to Ossossane, which was "most commodious" (17: 29) which probably meant that depopulation was greater there. However, during the same period, the Jesuits found a house at Scanonaenrat with only one fire in it.

Epidemic-related behavior. Disease-oriented behavior similar to that observed elsewhere would have facilitated transmission.

Panic flight was not observed in Huronia, but it was the

first reaction to disease by Huron traders at the St. Lawrence at the beginning of the first epidemic. They panicked when they became ill or saw their friends become ill, perhaps because they saw the effects of the disease on the Montagnais: "...the contagion which spread among all these Tribes last year, with great destruction, having suddenly seized several of our Savages, and filled the rest with fear, again threw us into confusion, and put us to great trouble seeing that we had to set out immediately" (8: 71-73). They did not stop to hunt or fish; they robbed, mistreated and abandoned some of the French, and threw their goods overboard--actions attributed by Brebeuf to their illness (8: 87). Thus, as observed elsewhere, contagion spread through sick individuals returning home and by healthy individuals leaving for other infected areas.

Curing ceremonies spread infection by mingling the sick with the well. Up to 80 performers were chosen for ceremonies for individuals (10: 207), and village cures could involve most of the healthy. At the height of the 1637 epidemic in Ossossane, men of every family assembled, dancing and drumming all night, and having a feast at daybreak. When they finished, the women began. The village cure lasted two days, and involved processions to all of the sick (13: 239-241). Later, all the sick attended the ceremonies in one cabin (13: 243). A three-day cure for a father and daughter in Ossossane consisted of dancing and singing "a good part of the night", and again the following night, and a sweat and a feast on the third:

20 men gathered and almost piled themselves upon one another. Even the sick man dragged himself thither, though with considerable difficulty, and was one of the troop; he also sang for quite a long time, and in the midst of the heat of this sweat he asked for water with which to refresh himself, - a part of which he drank, and the rest he threw over his body (14: 65).

He later died.

Reported cures included sexual intercourse between participants, including the patient (17: 147), and processing twice through all the cabins of the villages (17: 177-187).

Cures increased inter-village contacts also. When games of "dish" were prescribed, one village would challenge another, and men and the patient would crowd into a cabin for two or three days; some very old men were even carried to the game to enhance the power of their charms, and bring luck to the players (14: 81; 17: 203). Games of lacrosse were sometimes prescribed for individual or community cures (10: 185; 197; 13: 131):

Some time before [the arendiwane] had declared that the whole country was sick; and he had prescribed a remedy, namely, a game of crosse, for its recovery. This order had been published throughout all the villages, the Captains had set about having it executed, and the young people had not spared their arms; but in vain. The disease did not cease to spread, and to gain ground all the time (13: 131).

Curing ceremonies increased with epidemic effects (Trigger, 1976). The Huron "sought remedies for their diseases...with so distressful anxiety" that the Jesuits had to postpone teaching until the epidemic was over, and they saw "the minds of men restored to that tranquility necessary" for instruction (11: 17). The Jesuits observed many curing ceremonies, but there are indications that there were more in areas that the Jesuits could not

observe (17: 207).

Epidemics were the cause of political gatherings as well. Councils met to deal with the epidemics, discussing, for example, possible origins of and cures for the diseases and how to get rid of the French who were causing it. These "very crowded assemblies" met, of course, during the height of the epidemics (15: 27, 39; 18: 23; 19: 177).

Huron arendiwanes and the Jesuits circulated among the sick, undoubtedly spreading infection. The Jesuits visited the sick twice daily in 1636-37 in Ihonataria (13: 113, 167) and visited Oenrio at least seven times, Anonatea six, Onnentisati three, Ossossane ten, and the Nipissing camp several times - a total of 60 days. In 1639-40, the year of the smallpox epidemic, they took a census and visited every Huron and Tionnontaté house (though much of this was accomplished before the epidemic began)³ although they were aware that smallpox was contagious.⁴ Incidence increased in the three villages of the Rock Nation after Jesuit arrival, but this may have represented natural progression of the epidemic (20: 21). Recovery was more frequent

³Lalemont proudly reported to Cardinal Richelieu in March 1640 that "The Gospel has been announced to more than ten thousand savages not only in general, to each family and almost to every person individually" (17: 221).

⁴Although Lord Sydenham maintained that smallpox came from the atmosphere, most other 17th-century medical men believed it was contagious (Edwardes, 1902). At the St. Lawrence, the Jesuits advised uninfected groups to stay away from infected settlements (16: 103). Measles, however, were only learned to be infectious two centuries later (Gershon, 1972).

in cabins not visited by the Jesuits (19: 93). They may have transmitted secondary or concurrent infections as well as the primary one, or increased infecting doses.

It is hard to measure the normal frequency of inter-village contacts among the Huron. Did they increase during the epidemics? Presumably widespread illness precluded some visiting but the Jesuits learned of sick in other villages from Huron travellers (13: 165, 169, 189). During the first epidemic, when food distributed to the sick by the French was thought to be curative, people travelled "great distances" to Ihonataria--the village hardest hit--to procure bits of raisins and meat for sick relatives (8: 149). Rumors about epidemic origins and cures circulated widely and quickly. Information about causes of the disease and the French and their malevolent powers came from as far away as the Kichesipirini, the Neutral, and the Susquehannocks in Pennsylvania (13: 147, 211, 231; 14: 9, 35). Inter-village and even inter-nation contacts were evidently maintained.

Thus, the continuation of normal activities plus disease-oriented behavior transmitted infection more universally, farther and faster than would be permitted by quarantine and medical regulations in a modern epidemic. This resulted not only in much higher incidence, but probably also in greater morbidity and mortality, as coincident morbidity decreased the amount of care of the ill.

Nutrition, Care, Fatalism and Cures

Nutrition at onset of an epidemic and sustenance during

illness and recuperation periods affect the impact of the disease. Nutrition affects morbidity. During smallpox, food and fluids are essential (or tissue reserves will be used up) but difficult to administer, due to the condition of the patient: starvation is "very harmful...and possibly impedes the already feeble antibody response. It is here, of course, that skilled and patient nursing plays an important part in coaxing the patient to take some nourishment" (Dixon, 1962, p. 99). Nutrition affects the severity of the primary infection, and the incidence and severity of secondary infections is related to the degree of debilitation of the patient--partly a factor of nourishment during the primary infection. Moreover, poor nutrition increases the chance of blindness following smallpox (Dixon, 1962).

For the Huron, it is assumed that nutrition was generally adequate prior to the epidemics. However, in 1634, because of a series of droughts, the Ihonatarians' corn stores were depleted and all but two families traded elsewhere for corn. That fall, the first epidemic prevented the harvest of some crops: "...all these poor people have been much inconvenienced by (the epidemic) particularly during the autumn, as much in their fishing as in their harvest. Many crops are lying beneath the snow" (8: 87-89). Thus food was scarce.

The harvest of 1636 was good, but during the winter the Huron travelled over frozen Lake Huron to trade Huron corn for Algonkin fish: autumn fishing had been curtailed because of the epidemic.

The drought of 1638 caused a "serious famine" in June 1639, "prevalent in some parts - especially in Ossossane" (17: 119),

at least partly because of the use of stored food to feed the Wenroronon (12: 27). The harvest of 1639 was good in comparison with recent years (19: 81) but it was poor among the Neutral and Tionnontaté (20: 47-49).

Horticultural foods have been estimated as providing 80 percent of Huron food, in the proportion of corn, 65%; beans and squash, 15% (Heidenreich, 1971). The Huron usually had enough food stored to supply them during periods of crop failure. When stocks were depleted, the subsistence strategy included hunting, fishing, gathering and trading for food with neighboring groups.

Fortunately, the three epidemics were separated by a year or two. Nevertheless, the cumulative effect of successive epidemics on families deprived of several or many food producers as well as the decrease in work time because of illness and subsequent weakness, would have affected stored corn and other food supplies. Presumably the most serious nutritional deficiencies occurred during epidemics. Food scarcity would have decreased care and feeding of the ill, because the able would have had to be away hunting, fishing and gathering food. In the crucial days of severe morbidity and high incidence, therefore, lack of supplies and/or the absence of care-givers would have resulted in the lack of nourishment--the food and water necessary to survive and to fight off or render less serious secondary infections.

The Huron did not normally drink water: liquid was ingested through sagamite (corn soup). Possibly the ill did not receive sufficient liquids because they lacked an appetite.

It is not known what they fed their ill. The fact that the Jesuits fed the sick twice daily might mean that the Huron did not. One man, ill for months, was "very poorly nourished" (8: 131). The French noted that the Huron "wondered at the order we observed in caring for our sick, and the diet that we made them observe" (13: 101); this could mean that feeding the ill was not a Huron priority but it could also just represent Huron attempts to determine the French cures for the disease.

The Jesuits found very ill Huron being treated as though already dead--virtually ignored (14: 73; 15: 73, 129; 19: 187-189). Whether this was normal practice or a manifestation of the epidemic fatalism observed elsewhere is not known, but lack of nutrients and water during severe morbidity would have weakened the ill further, increased mortality, and prolonged recuperation if they survived. The Jesuits' provision of dried fruit, meat and broth twice daily to the sick of Ihonataria (8: 149) may have increased survival rates there.

The Jesuit Relations include many references to famine accompanying disease, presumably for the reasons cited. Decreased food supplies, successive epidemics infecting a poorly-nourished population, fatalism regarding recovery, and perhaps the absence of nourishment considerations in traditional treatment of the ill must have resulted in inadequate nourishment and thus greater morbidity, secondary infections and mortality.

Care of modern smallpox patients includes encouraging the patient to eat and drink, washing (to loosen scabs and prevent sepsis and gangrene), constant attention during the "acute

consciousness" of the "maniacal phase" (Dixon, 1962, p. 102), prevention of scratching to reduce chance of secondary infection (Benenson, 1972) and proper treatment of eyes to prevent temporary or permanent blindness (Roberts, 1978). Neglect increases the incidence of respiratory complications, including broncho-pneumonia and thus increases mortality (Dixon, 1962).

The Jesuits did not describe usual bodily hygiene, or washing during epidemics--except that of a newborn baby (19: 223). Paint of faces and bodies (sometimes consisting of soot from kettle bottoms), and oil and dye in hair, plus the dirt in cabins and on clothes, robes and mats could have caused secondary infections. Lalemont reported in 1639 that everything in a longhouse "is in a cloud of dust, and, if you go within, you will not reach the end of the cabin before you are completely befouled with soot, filth, and dirt" (17: 15).

Scratching may have been prevented, especially if bleeding occurred, but likewise it may have been permitted to ease itching. Patients uninterested in food may not have been encouraged to eat or drink.

The Huron demonstrated the will to help--in fact were frantic in their search for cures. They sought out men of power--both Huron and French--who might have knowledge of the spirit causing the disease and of appropriate remedies, and when Jesuit prescriptions and activities seemed only to increase mortality, they protected ill kin from their ministrations and even presence (12: 121; 13: 123-125, 133; 19: 169, 221, 263).

However, ignorance of medically-appropriate treatment and the practice of Huron cures often detrimental to patient welfare, would have increased morbidity and mortality.

Care of a convulsing patient was observed. A grandfather held his granddaughter in his arms for days: "...now he was compelled to sit down, now to lie down, sometimes on one side, sometimes on the other, - changing his posture at every moment, for she was restless, and in convulsions which lasted nearly all night" (13: 155). People of the one cabin in Ihonataria not infected in 1636-37 were "occupied solely in comforting the others" (14: 105): this may represent aid or perhaps only sympathy for sick relations, or condolences to relatives of the deceased. Usually, the Jesuits reported, only close relations looked after the ill, but as this was reported in 1640, it may represent behavior after three epidemics rather than custom (15: 23).

The Jesuits noted what they considered lack of care. A sick woman was found convulsing in her cabin, with no adults present (13: 195). An old grandmother was trying alone to cope with three sick grandchildren (her daughters having died). She lost her strength and sight and became too ill to grind corn or go out for firewood. Two of the children died, one for lack of mother's milk. None of her distant kin would help her because (the Jesuits believed) she "favoured" Christianity (19: 235-237).

The Jesuits saw a pregnant woman delivering her premature dead baby in the open in the hot sun, and then dying (14: 49);

an abandoned baby out in a field, who died (23: 117); a sick child "lying upon its back, abandoned by its mother, who was only awaiting the hour of its death" (14: 73); and a girl, although very ill, without a mat to lie on or a fire to keep her warm, and without sufficient covering (19: 189).

Although what seemed neglect may have sometimes represented usual practice, or what seemed abandonment may sometimes have been temporary absence due to subsistence activities elsewhere, it is likely that fatalism was widespread, especially during periods of greatest morbidity and mortality or after remedies were seen to fail and the belief spread that although the French had knowledge of the disease and knew the cure, they wished to kill all the Huron. The cessation of care of patients who had lost consciousness and who were apparently considered as dead already may represent a lack of expectation of survival based on recent experience, or the belief that the cure would be found elsewhere than in nursing.

Native cures--although psychologically satisfying--would often have been detrimental. The patient often actively participated, e.g., in sweats, dances and even sexual intercourse, or was carried between villages or endured cures of up to three days which involved much noise and commotion. Abrupt changes in temperature involved in having a sweat and then bathing in a river or washing in cold water, and the experience of walking through the fires in a longhouse must have been harmful. (A man who took a sweat died, and a woman who walked through the fires was very sick afterwards.) (14: 65; 17: 177-187).

However, French treatment was also harmful, e.g., blood-letting, believed in the seventeenth century to be a smallpox cure. During one visit to Ossosane in 1636, 200 Huron--both well and ill--were bled (13: 181). This procedure killed many smallpox patients in Europe (Dixon, 1962) and probably many in Huronia as well.

Travel

Huron who became ill away from home kept travelling. Most were helped home by companions (8: 87-89; 13: 137; 19: 169; 12: 227) although one was abandoned (19: 107). Reasons for wanting to reach home may have included:

- a) cure - prescription by arendiwanes and participation in remedies by family and friends were necessary to affect cures;
- b) burial - certain ceremonial and material aspects of burial were important (although bones of Huron who died elsewhere were returned to Huronia for burial);
and/or
- c) vulnerability to enemy attack, if some of the party were ill.

The physical hardships and exertions of canoe travel and portaging while ill, along with oftentimes insufficient nourishment, undoubtedly killed many who might otherwise have survived.

Environmental Factors

The epidemics extended through the winters. The winter of

1634-35 was short and mild (8: 155) but that of 1636-37 was unusually cold, harsh, long and snowy (13: 249). (Deep snow made travel difficult, but hunting easier.) In the winter of 1639-40, sixty Huron died of exposure in the snow (18: 43).

We do not know how unusual this figure was: it was the author's first year in Huronia. If it was higher than usual, it may reflect a harsh winter, weakened constitutions, attempts at subsistence activities by those not yet fully recovered and/or poorly nourished, and/or scarcity of skins because of increased numbers of interments and lowered productivity due to epidemics. (The Huron practice of giving double the number of gifts when people died of cold must have resulted in greater scarcity, if continued at this time - 10: 163-165, 273.)

In winter, Huron longhouses were cold and smoky. Brebeuf found that the Jesuit cabin, even when improved by the addition of doors, let in the "rain, cold and snow" (8: 109). During winter, "the greatest inconvenience is the smoke, which, for want of a chimney, fills the whole cabin; ...when certain winds blow, it is no longer possible to stay therein, because of the pain felt by the eyes" (18: 17-19). "...there is smoke in good earnest, causing many to have great eye troubles, to which they are subject, even towards the end of their lives losing their sight" (Biggar, 1922-36, 3: 124). "...the smoke is very often so thick, so annoying, and so obstinate that, for five or six days at a time, if you are not entirely proof against it, it is all you can do to make out a few lines in your Breviary" (10: 93).

The Jesuits described a man "who lay on the bare ground during four or five months...so thin that he was nothing but bones, in a lodge so wretched that the winds blew in on all sides; covered during the cold of winter with a very light skin of some black animals, perhaps black squirrels..."(8: 131). Another was similarly disposed, but without a fire. If entire villages were prostrated, with many sick at once and if fatalism prevailed, these conditions may have been usual.

It is true that the French were comparing these conditions with those surrounding French sick-beds, and that sleeping beside the fire under animal skins was usual for Huron in winter (8: 109) and much less unhealthy than the French believed. Indeed, it was observed that in one winter, despite the cold and smoke, none of the French suffered from colds, catarrh or disease (10: 101). In addition, the ill would have been on the ground, where the smoke was least dense.

Lack of data on epidemics observed under such conditions makes it difficult to assess the effects. Epidemiological data do indicate that:

- a) poor treatment of eyes infected during smallpox increases incidence of temporary and permanent blindness (Roberts, 1978).
- b) "dense fog, particularly if it is associated with atmospheric pollution and low temperatures can have a profound effect on mortality from respiratory diseases, particularly at the extremes of age", and .
- c) cold may increase susceptibility to infection and it

increases mortality from broncho-pneumonia following smallpox and from respiratory diseases in general among the elderly (Taylor and Knowelden, 1964).

Although the Huron were accustomed to wintering in cold and smoky conditions, it seems probable that high incidence resulted in worse longhouse conditions, which would have increased morbidity as well as mortality rates among people suffering the severe effects of these introduced diseases.

Discussion

Despite the sparseness of the data, many of the characteristics described as increasing damaging effects of virgin soil epidemics were reported for Huronia. Specifically in Huronia:

- a) Transmission between houses and communities and within houses would have been increased by:
 - high mobility at time of introduction;
 - dense communal living during the epidemics;
 - communal treatment of the ill and handling of the dead; and
 - political gatherings which increased with anxieties about the epidemics.
- b) Debilitation of patients would have resulted from:
 - Huron and some Jesuit cures, lack of care-givers, and lack of appropriate care;
 - lack of food and water because of scarcity, lack of providers, or disinterest;
 - travel;

- environmental characteristics - cold and smoke;
- three successive epidemics with associated secondary infections within seven years; and
- fear and fatalism.

Epidemics as physically experienced by the Huron were thus much worse than modern, medically-tended ones in terms of conditions, misery, fear and also in damage sustained. The Huron experience thus supports the hypothesis that no ~~greater~~ susceptibility is required to explain the relatively high rates of incidence and mortality and degree of morbidity suffered in virgin soil epidemics: epidemic characteristics and the population's response can account for it.

Huron Epidemic Depopulation

It is impossible to determine exactly the identity, incidence, mortality, impact and social effects of contact epidemics. Regional variation, lack of records and other causes of death confuse the picture. Identification of diseases are difficult. Observers were usually medically uninformed and their diagnoses were based on restricted samples and their own experience of disease. Identification was made more difficult also because secondary infections, concurrent diseases, and harmful habits and/or treatments altered the symptoms.

Estimates of the extent of spread of epidemics are often based only on observed or reported occurrences. However, spread

along trade routes and various other inter-group contacts - warfare, capture, kinship - must be expected (Stearne and Stearne, 1945; Dobyns, 1966; Cook, 1966). Some civilizations, such as those of the Mesa Verde and central Mexico may even have been destroyed before contact by diseases introduced in the proto-contact period (Cockburn, 1971). Lack of references to epidemics in the literature "may reflect our paucity of information more than it does their state of health or freedom from epidemics" (Ewers, 1973, p. 107).

Observers' estimates of mortality could be too high because of factors of which they were ignorant. For example, the reports of a New England village in which 950 out of 1000 inhabitants died may have been based on absence of living persons rather than a count of dead ones. This type of epidemic data ignores other reasons for local population decreases often concurrent with epidemics, such as killings and captures and retreat from epidemic locales for reasons of fear or from enemies because of greatly decreased strength. Thus estimators may have mistaken depopulation for mortality rates. Likewise, estimates may be too low, because of population increases (or lack of decreases) among groups receiving captives or refugees. For example, the population of the New York State Iroquois has been said to have been only temporarily decreased by epidemics as evidenced by the fact that their population increased from 5,500 in 1600 to 17,000 in 1907 (Stearne and Stearne, 1945). This statement fails to take into account the hundreds who joined the Iroquois voluntarily or as captives--during and after the epidemics.

In sum, analysts may ignore proto-contact epidemic mortality and thus underestimate original population rates. They may also overestimate or underestimate fatalities in observed epidemics.

The lack of verifiable data, and the presumed unlikelihood of further sources emerging, precludes accurate determinations; but our figures and analyses can be informed by modern virgin soil epidemic data (although uncertain disease identification of historical ones make comparisons difficult).

Huron Depopulation Estimates

Historical reports and recent analysis have estimated Huron population to be:

<u>Source</u>	<u>Pre-Epidemic</u>	<u>Post-Epidemic</u>
French:		
Champlain, 1616 (Biggar, 1922-36)	32,000	
Sagard, 1623-24 (Wrong, 1939)	30,000-40,000	
Brebeuf, 1635 (Thwaites, 1959)	30,000	
Lalemont, 1640 (Thwaites, 1959)	30,000	12,000 10,000
Current:		
Trigger (1969)	18,000	9,000
Heidenreich (1971)	21,000	9,000
Wright (1977)	(higher than Trigger's estimate)	

Explorer and missionary estimates of precontact American Indian populations have been criticized as being deliberately exaggerated, to enhance the glory of conquest or increase mission

support; therefore, these estimates have often been disregarded. Cook (1966) suggests, however, that it is unlikely that missionaries regularly and everywhere lied to their superiors; such historical estimates may be valid and should be treated with estimates arrived at by other means.

Champlain's figure came from the Huron, probably through his interpreter, Brulé. Presumably the Huron knew their strength and were not misunderstood by Brulé. However, the Huron could have lied or Champlain could have inflated the figure. It is also true that the Jesuits may have simply repeated Champlain's figure, as Heidenreich and Trigger suspect, but they might also have been corroborating it, or revising it, in Sagard's case. That Lalemont used the figure in 1640 might indicate that the Jesuits thought it accurate even after their knowledge of the country had increased. However, it must be pointed out that he quoted the figure in a letter to Cardinal Richelieu in which he requested French assistance in protecting the mission, and thus may have exaggerated the depopulation figures to gain sympathy for his cause. Nevertheless, the reiteration of one figure through three decades--especially the last, if it was the product of Jesuit investigation--renders it at least provisionally acceptable, in the absence of contrary data.

No census was taken until 1639-40 and it was this count which provides post-epidemic figures. The Jesuits visited "each family's hearth, whereof we tried to omit not one" (19: 127) and counted, among the Huron, Petun and Wenroronon immigrants, "thirty-two hamlets and straggling villages, which comprise in all

about seven hundred cabins, about two thousand fires, and about twelve thousand persons" (19: 12) -- an average of just under three fires per cabin and three persons per family. Earlier estimates indicated more fires per cabin. Champlain (1616) and Sagard (1623-24) report 8, 10 and 12 fires per house. In the winter of 1638-39, Ossossane apparently had four or five fires per house (15: 53; 16: 243). There would presumably have been even fewer had not the majority of the Wenroronon refugees settled there in 1638, and presumably fewer still if Ossossane had not relocated after the first epidemic. The decrease to three fires per cabin in 1639-40 is probably due to epidemic depopulation, and Lalemont's description of the settlements as "stragglings" may refer to the reduced population within them.

The census was taken the summer before the smallpox epidemic - probably the most deadly of all - but Trigger believes that the report of the figure the following spring indicated it had been somehow adjusted to reflect smallpox deaths: "The unnaturally low average of three persons per family and the fact that the combined population of 12,000 for the Huron and the Tionnontaté continued to be accepted as accurate for the next decade suggest that the published figures were adjusted to take account of the substantial loss of population that occurred in the autumn of 1639 and over the following winter" (Trigger, 1976: 578) (this in contradiction to his earlier assertion that pre-epidemic population estimates weren't accurate but only repeated for want of better ones).

Lalemont reported in March 1640 that "in less than 10 years

they have become reduced from thirty thousand souls to ten thousand" (17: 223). We don't know if he was including the Tionnontaté in this figure; if he was, it might represent an adjusted figure. If he wasn't, it might represent the Huron portion of the 12,000 combined population.

Trigger arrives at a pre-epidemic population of 18,000 by estimating a post-epidemic population of 9,000 and assuming a 50 percent reduction by smallpox, based on smallpox depopulation somewhere else. However, he fails to account for deaths suffered in the first two epidemics. He also estimates pre-epidemic population by applying pre-epidemic average family size to the number of hearths reported in 1640. He suspects that three hearths per cabin is too low because of earlier, higher figures. Nevertheless he calculates pre-epidemic numbers on that basis (2000 hearths, two families per hearth; and six people per family) to be 24,000 Huron and Tionnontaté, or 18,000 Huron. However, if three hearths per cabin reflected depopulation following two epidemics, and five or more hearths per cabin was the original average, as he notes elsewhere, there would have been about 3,333 hearths and thus 40,000 Tionnontaté and Huron, or 30,000 Huron, originally.

Heidenreich (1971) calculates pre-epidemic population from the post-epidemic census and a 50-70 percent mortality rate from the smallpox epidemic: if 10,000 remained and the mortality rate was 50 percent, 22,000 would have been the pre-epidemic population. If the rate was 60 percent, original population would have been 25,000 and if 70 percent, 33,000. He also calculates

original population by multiplying the number of warriors reported pre-epidemic by Champlain and Sagard (although he had discounted their population estimates) by the average size of family (estimated): assuming there was one warrior to a family, the original population would have been 12,000-18,000. Finally, he estimates individual nation and village populations, and totals them for a figure of 20,400. He concludes that Champlain's figure was too high by about a third, and that a 21,000 pre-epidemic population estimate is more accurate. According to his calculations, that would mean a 50% depopulation. However, his estimate of epidemic depopulation omits depopulation from the first two epidemics. Moreover, although he discounts Sagard's and Champlain's original population estimates he accepts, but doesn't justify his acceptance of, their estimations of numbers of warriors. Thirdly, his estimates based on archaeological data need revision: recent findings indicate that the "18 to 25 historic Huron villages, which average 5 acres in extent, could readily have accommodated 30,000 people. Total or near-total village excavations that expose all of the longhouses are permitting accurate estimates of the number of families in a village and are thereby providing a formula for population estimates that appear to be more in accord with Champlain than with the estimates of Dr. Trigger and Dr. Heidenreich" (Wright 1977, p. 184).

Both Trigger and Heidenreich unaccountably estimate epidemic depopulation on the basis of a single smallpox epidemic, omissions which exemplify the current neglect of the disease

factor in Iroquoian studies.

Depopulation after Three Epidemics in Huronia Estimated
According to Mortality Rates Elsewhere

Projecting epidemic figures from one case to another is hazardous. Mortality rates vary considerably, and many factors influence them: nature of the infection, strain or variety of the infection, settlement and visiting patterns, treatment, degree of fatalism, mobility, mortuary practices, nutrition, standard of hygiene, environmental factors, degree of coincidence of morbidity, presence and virulence of concurrent diseases and numbers and timing of successive epidemics (Taylor and Knowelden, 1964; Dixon, 1962; Millar, 1977; Crosby, 1976; Neel et al, 1970).

As demonstrated above, many of these factors rendered the Huron more vulnerable to morbidity and mortality. Therefore the figures from other groups may not be too high for the Huron: in fact, figures from hunter-gatherer groups may be too low. In this instance, where so little data exist and estimates vary, a cross-cultural comparison is attempted because it offers an additional method of estimating depopulation.

Two other major problems in estimating epidemic depopulation according to mortality rates elsewhere are disease identification and rate of incidence. The French could not or did not identify the diseases, except the last, and did not furnish much information upon which a modern diagnosis could be based. The different effects of disease on virgin soil populations makes diagnosis difficult.

Likewise, they could not report incidence throughout Huronia

because they were not present everywhere, at least during the first two epidemics. These estimates are conservative: epidemics are not projected much beyond Jesuit observation, although greater-than-reported (because greater-than-observed) incidence was probable; fatalities due to the infection introduced by the Wenroronon are not included because of lack of data; and the post-epidemic population estimates are not adjusted to include Wenroronon immigrants.

Mortality in 1634-46 - Identification. Brebeuf thought it was smallpox or measles, but different from cases in France (typical in virgin soil epidemics). The alimentary tract infection--diarrhoea--could have been a secondary infection in debilitated patients, such as dysentery, which followed measles epidemics in Fiji in the nineteenth century and in the Yukon in 1942 (Neel et al., 1970; Marchand, 1943).

Transmission of smallpox at this date to the St. Lawrence and Huronia was possible: epidemics occurred in Europe from 1629 on (Creighton, 1965); Massachusetts Indians may have had it in 1633, and the Mohawks in 1634 (Cook, 1973; Anon, 1959).

The detailed progression of the diseases in two cases resembles textbook smallpox rather than measles: one began with a high fever (in measles the fever peaks the first day or two after the rash) and another experienced eye trouble with the rash (in measles they precede the rash). However, the data are sparse and variation in symptoms is too great--especially in virgin soil epidemics--to make certain identification in this way.

Trigger suggests it was measles, as the French so certainly identified the 1639-40 epidemic disease as smallpox.

For a conservative estimate, it will be assumed that it was measles, as mortality rates are lower than for smallpox.

Other Virgin Soil Measles Epidemics

Incidence:

Yanomama, 1968	Almost 100% (Neel et al., 1970)
Fiji, late 19th century	Very high (Neel et al., 1970)
Ungava Bay, 1952	99% (Crosby, 1976)
Yukon Indians, 1942	95% (Marchand, 1943)

Mortality:

Brazilian Indians, 1954	(Case fatalities): With care: 9.6% Without care: 26.8% (Crosby, 1976)
Yanomama	Case Fatalities: 8.8% (Some medical care provided)
Fiji	Great Mortality
Caddoans, East Texas 1759 1803	"Took its toll of lives" "Considerable" (Ewers, 1973, p. 108)
Western Greenland	Despite good medical care, mortality rate 15 times greater than non-virgin soil epidemics (Black et al., 1976).

Typically incidence is almost universal. In Huronia, there was almost universal incidence in the Bear Nation, which was the largest Huron nation (occupying half the seats on the confederation council) and thus perhaps had half the Huron population. Incidence in the other three nations is unknown. Incidence in Huronia is thus estimated at 50%.

Many deaths were reported for Huronia. We have only one mortality rate for a virgin soil, untreated measles epidemic - 26% for Brazilian Indians. A somewhat lower figure of 20% for half the Huron is used here, giving a depopulation rate of 10% (Table A).

Mortality in 1636-37 - Identification. Trigger (1976) suggests it was influenza. Of influenza symptoms--cough, fever, chill, headache, malaise and anorexia, with prostration in severe cases (Douglas and Betts, 1972)--Brebeuf described headaches, fever, anorexia and prostration. In influenza, fever and aches persist for three days, followed by respiratory symptoms lasting three to four days. Cases in Huronia were longer, which might be expected in a virgin soil epidemic, but no respiratory symptoms were described. Identification is far from certain, but here it is assumed that it was influenza, and, to keep the estimates conservative, it is assumed that the same disease spread widely during the summer (although influenza is a cold-weather disease).

Other Virgin Soil Influenza Epidemics

Incidence:

May exceed 50% in virgin soil epidemics (Douglas and Betts, 1972)

Tchika Indians (Brazil, 53 people) 100% (Crosby, 1976)

Mortality:

Cheyenne and Arapaho (1889-1899) "Fatal in a large number of cases" (Ewers, 1973, p. 109)

Green-Akoroos (Amazon Basin, 1960s) 15% (one attack) (Crosby, 1976)

Inuit (Victoria Island) 20% (Taylor and Knowelden, 1964)

Incidence throughout Huronia was very high, especially as the infection circulated for over a year, later infecting people untouched earlier. Although mortality rates in Huronia over one year may well have been higher, a 15% depopulation estimate is used here.

Mortality in 1639-40. This seems to have been a smallpox epidemic. Virgin soil smallpox fatalities have been recorded in terms of depopulation rates:

Indians, a California Valley	75% (Dobyns, 1966)
Cherokee	50% (Ewers, 1973)
Catawbas	Nearly 50% (Ewers, 1973)
Piegans	50-66% (Thompson)
Omahas	50% (Crosby, 1976)
Nantucket Indians	64% (Cook, 1973)
Mandan	90% (Ewers, 1973)
Pueblo	74% (Stearne and Stearne, 1945)

Because this epidemic affected all of Huronia, general depopulation figures can be used. There are no estimates for groups as large as the Huron: the Mandan were reduced from 1600 to less than 140, and the Nantucket group from 348 to 125. However, as all Huron communities were infected, there seems no reason not to expect similar percentages. A conservative estimate of 50% depopulation will be calculated. However, because this epidemic was the most fatal and probably the most universal, 60% depopulation will also be calculated. This figure is still low considering the depopulation cited for other horticultural groups.

TABLE A: Estimated Depopulation Rates for the Three Major Epidemics in Huronia, and Size of Remaining Population, Calculated for Estimated Original Huron Populations of 30,000 and 20,000. Smallpox Figures are Calculated for Both 50 and 60% Depopulation.

<u>Epidemics</u>	<u>Mortality Rates</u>	<u>Original Population</u> of 30,000		<u>Original Population</u> of 20,000		<u>Cumulative Depopulation</u>
		<u>Fatalities</u>	<u>Population Remaining</u>	<u>Fatalities</u>	<u>Population Remaining</u>	
1634-35 (measles?)	10% (50% incidence, and 20% case mortality)	3,000	27,000	2,000	18,000	10%
1636-37 (influenza?)	15%	4,050	22,950	2,700	15,300	23.5%
1639-40 (smallpox?)	50% (60%)	11,475 (13,770)	11,475 (9,180)	7,650 (9,180)	7,650 (6,120)	61.8% (69.4%)

Discussion

Thus a conservative estimate (Table A) of disease depopulation following three Huron epidemics is 64% (70%): 10% in the first, 23% by the end of the second, and 64% (70%) by the end of the third. If the original population was 30,000, there remained 11,425 (9,180) Huron in 1640; if it was 20,000, there would only have been 7,650 (6,120) left, which renders the 20,000 original population estimate too low.

On the basis of a post-epidemic population of 9,000, and estimating a 50% depopulation from smallpox, Trigger estimates an original population of 18,000. However, if depopulation was 64% for three epidemics, and 9,000 remained, the original population would have been 25,000; and if depopulation were 70%, the original population would have been 30,000.

If depopulation was greater than estimated here, and it easily could have been (e.g., it is unlikely that the first epidemic affected only the Bear Nation or that the second killed only 15%), Sagard's estimate of 30,000-40,000 could be accurate and the loss of numbers greater than is currently believed. Moreover, Huron perceptions of the epidemics as depicted below suggest that to the Huron and groups similarly affected the experience was more important to them and their subsequent outlook and behavior than is currently recognised.

Huron Perceptions of the Epidemics:

Interpretations and Evaluation

Virgin soil epidemics are considered disasters (Barton, 1963). Evaluations of and responses to disasters are as much

results of subjective meaning as of damage sustained (Schneider, 1958; Cawte, 1978). "A disaster is a mental construct defined not by facts but by the symbolic component" (Barkun, 1977).

Huron perceptions of and responses to the epidemics stemmed from their traditional view of disease and from their developing view of the French, especially the Jesuits.

Traditional View of Disease

Agents causing disease were spiritual or human. Spirits--okis--resided in various natural phenomena. They controlled natural events, and had to be placated with proper behavior and sacrifices. They could cause disease. Remedies, expressed sometimes as satisfaction of subconscious desires of the soul, were revealed in dreams of the ill or a relative or by discernment by a specialist--an arendiwane.

An arendiwane's description of his learning about the disease during the second epidemic illustrates Huron coping mechanisms. Various spirits told him they had ruined the country through contagion. A spirit of a nearby island, who also caused storms and subsequently ate drowned Huron, was said to be the worst. The spirits (called "okis" by the Huron) offered to "take pity upon the country" and to associate the arendiwane with them, to stop the epidemic. He agreed, and they taught him some cures. They threatened to take him away several times, but he successfully resisted, by his own power. Although they reproached him for some inexactitude, eventually they accepted him as their associate, said they could no longer harm him, and taught him some of the ways - e.g., eating only clear soup

with strawberries in it. They recommended dog feasts, certain ceremonies, masks hung in doorways and straw men erected over cabins as cures (13: 227-231).

Other agents of disease were humans, who could kill by spells, by causing one or many charms to enter a body, causing illness. Death occurred unless they were detected and removed. Agents were identified through dreams, suspicious actions, or arendiwane detection, and once identified they were usually killed.

Cures and disease prevention activities could last for days, arendiwane alternately seeking knowledge and applying remedies.

Required for the prevention or cure of disease was:

- determination of cause and agent, in order to become associated with okis and thus to learn;
- preventatives and cures;
- power and courage, to approach and become associated with okis, as they were dangerous;
- perfect knowledge and performance of remedial activities.

The Huron labelled oki "things that have supernatural virtue" (33: 211). Arendiwane could predict the future and control the weather as well as treat disease. Other people characterized as oki were madmen, exceptional warriors and the French at the St. Lawrence. Charms used by Huron for luck in subsistence and other pursuits received their power from okis, who showed their proper use in dreams. Thus Huron knowledge, power and control originated in and was revealed by okis and preserved in the

customs and ceremonies of each Huron nation. Each nation

has brought its special dances, customs and ceremonies, all emanating from the same source, which are communicated to the whole country, and which are then observed according to the dream or the ondinonc of each one, when he is sick, or by the order of the native Physician, or visitor, who has with reason been styled "Sorcerer" or "Magician"... And such observances are called among them "Onderha", that is to say "the ground", as one might say, the prop and maintenance of their whole State". "These, the old men and the Captains say to us, "are what we call affairs of importance" (17: 195-197).

Both tradition and innovation were involved: the body of knowledge transmitted between generations and groups was augmented by the seeking of knowledge or specific cases - to detect which existing practice was appropriate or to learn new ones.

Huron Attempts to Prevent or Cure the Diseases

Huron response to the epidemics took traditional form.

Agency. Identification of agent and of his motivations were sought. Known okis were suspected. Ataentsic, the Huron creator, was said to have infected the Susquehannock (from whom it was said to have spread to the Mohawk and then the Huron) because her grandson was angry with them for warring continually and wanted "to make them all die" (14: 9). Various Arendiwane claimed knowledge of the disease and cure, and treated individuals and villages. Sorcery was suspected, and some accused were killed: "you hear nothing else talked about in this country, there being hardly any sick people who do not think they have been poisoned" (13: 157).

The agency most reportedly suspected was the French--in particular the Jesuits. Although the Huron had welcomed the Jesuits back in 1634 (partly because of their extraordinary

powers) the Jesuits were accused during the first epidemic of killing the Huron and separating them after death through baptism. During the drought the following spring--especially serious because the previous harvest had been poor--an arendiwane complained that not only was the cross preventing his powers from having effect, but that the epidemic had been caused by the French.

Proof of Jesuit agency was abundant. Their arrival coincided with the beginning of the epidemics. They were always among the sick, but never ill (until the second epidemic) and only one was known to have died in 25 years (19: 91). If they were excluded from cabins, the sick recovered (19: 93). The wampum given by the French at a Feast of the Dead had been given not for the dead, it was recalled, but to lead the Huron to heaven (13: 209). Their picture of the last judgement illustrated the people they'd killed (14: 103). A sick Tionnontaté vommitted a lead pellet (15: 19), proof of French sorcery.

The Jesuits spoke continually of their spirit, of behavior appropriate to its appeasement, and of punishment for failure to do so, including epidemic death. They sought out the dying.

Attempted explanations of French motivation varied. If they had come all the way from France, it was reasoned, they must have an important mission. They were killing the Huron:

- so that Brebeuf could somehow profit,
- to avenge Brulé's murder by the Huron,
- so the Huron could see God more quickly,
- to have Huron souls to torture in heaven, and/or

- because Champlain died wishing to exterminate the Huron.

Corroborations of these beliefs came from ever-increasing distances. Brebeuf had said, when he arrived, that the Jesuits would kill many and then go elsewhere, until they ruined the whole land. A Huron saw the French bringing misfortune in a dream, and a French woman--perhaps Brulé's sister--was seen by an Algonkin infecting the country with her breath (14: 51). Two English women seen by a Huron returning from the dead said the Jesuits would stay until they had killed all the Huron. Some English on the St. Lawrence confirmed that the Jesuits caused disease (15:31). The Susquehannock reported that Europeans near them said that Jesuits were imprisoned in Europe, as they were known to cause death (17: 123). Thus proof of Jesuit agency came from the Jesuits themselves, the Huron, the English in North America and Europeans.

It was a continuing Huron belief, during and after the epidemics, that the Jesuits were ruining the country with methods other than disease. They were also:

- a) interfering with Huron ceremonies and remedies
 - by persuading converts not to participate;
 - by interfering with arendiwane powers, by using rosaries, crosses, etc.;
 - by refusing to provide gifts required by dreams (17:173);
 - by taking away the power of charms (17: 207);
 - by preventing dreams (17: 207);
 - by threatening disaster if the Huron performed their own remedies (17: 121);

- b) separating relatives and countrymen after death;
- c) conspiring with Huron enemies; and
- d) refusing to help the Huron with their knowledge of and powers over disease, famine, drought, and enemy attacks (17: 121).

Seeking Prevention and Cure

Arendiwanes sought agents and cures in their usual manner. Villages requested their help both to prevent and to cure disease. At first the French were likewise approached: and thus during the first epidemic, as Jesuits prescribed, there were communal village vows to believe in God. French ministrations - baptism, blessing, bits of food and drink and medicine - were sought. The sprinkling of the ill with water by an arendiwane may even have represented Huron utilization of French remedies.

However, as the Huron increasingly suspected French activities as sorcery leading to death rather than remedies leading to cures, they protected themselves from French attention and even presence: longhouses and even villages denied them entrance and individuals threatened approaching Jesuits, verbally and physically. A council resolved to send them back to the St. Lawrence. This hostility alternated with visits to the Jesuits seeking cause, prevention and cure: the Jesuits, it was believed, knew these and needed to be approached and persuaded, tricked or frightened into revealing their knowledge.

When the village of Angoutenc was stricken in the summer of 1637, the Jesuits

found a considerable number of sick people, but they wrapped themselves in their robes and covered their faces, for fear of speaking to us; others, upon seeing us, hastened to close the doors of their cabins. We already had our feet upon the threshold of two others, when we were driven away, the reason given being that there were sick persons there. Ah! this was precisely what we sought, nor did we lose courage thereat;...we judged that his hostile aspect arose only from the fact that they were not yet well informed as to our purpose in these visits...it was a great novelty to them to see persons who sought out only the sick, and, moreover, the most wretched and most forsaken (15: 23).

The Jesuits visited the headmen "that we might try to make them understand our purpose". One told them they were afraid of the Jesuits, and that perhaps a council should be called. The headmen and people of Angoutenc met, and the chief headman asked people to listen carefully "-that the matter was one of importance, and deserved to be well understood" (15: 27). After the Jesuits spoke, the elders said they appreciated their love for the Huron, and "that the young men should be very careful not to strike a blow for which the whole country might groan" (15: 29). Nevertheless, in a subsequent visit, a "very sick old man...said, the angry blood mounting to his face, It is you people who are making me die; since you set foot in this house, six days ago, I have eaten nothing; and I have seen you in a dream as persons who are bringing us misfortune; it is you who are making me die" (15: 29). The Jesuits perceived so much distrust of themselves there that they stopped visiting. They were later told that the council had subsequently decided to kill one of them.

They marvelled that the captains "still continued, however, to console us by their visits. It seems as if God sent the Chiefs

to us, one after another, to be informed of our proceedings" (15: 31). The Jesuits, like the okis, were feared, but had to be approached if the origin and remedy of the disease was to be discovered. The seeming ambivalence of Huron behavior mystified the Jesuits, much as the French protestations of friendship while apparently destroying the country angered the Huron.

A Re-evaluation by 1637

Emotional restraint, characteristic of North American Indians, was noted by the Jesuits during the first epidemic:

What shall I say of their strange patience in their poverty, famine, and sickness? We have seen this year whole villages prostrated, their food a little insipid sagamité; and yet not a word of complaint, not a movement of impatience. They receive the news of death... not only without despair, but without troubling themselves, without the slightest pallor or change of countenance (8: 129-131).

Emotional displays gradually increased. There was "apprehension" and "dread" in the spring, when Jesuit malevolence was suspected. In later epidemics the Huron sought cures "with so distressful anxiety" (11: 13-15) and were troubled by "affliction and despair" (15: 55). A headman said, "What wilt thou have? Our brains are disordered" (13: 235).

By the summer of 1637 - the height of the worst epidemic yet experienced - emotions ran high. Following a confederation war council, a three-session council was held "to deal with the affair of the black robes, who were everywhere believed to be the cause of all the misfortunes of the country" (15: 39). The Jesuit description is extensively quoted to illustrate Huron perceptions, fears and responses.

The council head greeted each headman, "rejoicing with them that they had auspiciously assembled to deliberate upon a matter which was the most important in the country." Then he exhorted all those present to proceed seriously upon this occasion, when their preservation was at stake; for it was a question of discovering the authors of the common malady, and remedying the evil... Thereupon the Master of the solemn feast of the Dead, who is the chief of council for the whole country, began to speak, and exaggerated the deplorable conditions of his nation. He concluded his discourse by taxing us with being persons who for a long time had had some knowledge of it... I do not know that I have ever seen anything more lugubrious than this assembly. In the beginning, they all looked at one another like corpses, or rather like men who already feel the terrors of death; they spoke only in signs, each one undertaking the enumeration of the dead and sick of his family. All that was only to incite them to vomit more bitterly upon us the venom which they concealed within (15: 39-41).

Although elders had previously shown respect for the Jesuits, and discouraged overt hostilities by youths and others, none defended the Jesuits at this time, although some remained silent.

They were all like so many accusers who keenly urged on the Decree for our condemnation, doing all they could by their words and their repetitions to take [Brebeuf] unawares in some of his utterances (15: 41).

An old war captain said,

My brothers, you know well that I hardly ever speak except in our war councils, and that I concern myself only with affairs of arms; but I am obliged to speak here, since all the other Captains [of his group] are dead. Now before I follow them to the grave I must free my mind; and perhaps it will be for the good of the country, which is going to ruin. Every day it is worse than before; this cruel malady has now overrun all the cabins of our village, and has made such ravages in our own family that, low, we are reduced to two persons, and I do not yet know whether we shall escape the fury of this Demon. I have seen maladies in the country before, but never have I seen anything like this; two or three Moons sufficed for us to see the end of those, and in a few years our families being restored, we almost lost the memory of them. But now we already count a Year since we began to be afflicted, and we see as yet no probability of soon beholding the end of our misery. What

has caused us the most uneasiness, up to the present, is that we cannot at all understand this disease, and that we have not yet been able to discover its origin (15: 43).

He proceeded to "discharge his rage". Then the captains

importunately urged the Father to produce I know not what piece of bewitched cloth that he was keeping to the ruin of the country, - assuring him that his life would be spared, in case he would admit that it was at our house (15: 45).

When Brebeuf denied it, another said "But if thou wilt only tell us what makes us die". Brebeuf said,

I have often told you my Brothers, that we know nothing about this disease, and truly I do not think you could discover its origin, - that is hidden from you.

He proceeded to preach, but was interrupted:

For...we desire to discover the authors of our sickness' and as if the Father had not yet said anything, he began to urge him more than ever to show this bewitched article.

An old man said to Brebeuf, "If they split thy head for thee, we will not say a word". The headmen "postponed the conclusion of the whole matter to the return of the Huron who had gone down to Kebec", but some "begged Brebeuf to instruct them as to what means they should employ to appease God" (15: 47).

The war captain who seemed to be the most incensed at us, finding himself greatly disappointed in his expectations, did not hesitate to say that he was sorry he had not kept that one of Ours who arrived last, and put him to the torture, 'to draw from him', he said, 'the whole truth that his brothers conceal from us. I would doubtless have ruined him, and caught him in some of his words' (15: 49).

Despite the hostility, one captain slept in the French cabin, and

most of them came to ask us, some for one thing, some for another. But there is nothing so common among

the Savages as ingratitude. Throughout the country, people had held a very bad opinion of this assembly, and many were expecting to hear news of our death; some circulated a report that one of the Chiefs of the council had raised his hatchet against the Father.

The evil reports increased yet more after this councilLately, some Savage, I do not know who, almost strangled a young French boy near our cabin...some other hot-heads have been hatching evil designs against Ours (15: 51).

A Huron

...informed us that several of the Captains who had been present at the council, and had spoken against us, had fallen sick; that he came in their behalf, to know our opinions on the subject and what they should do to recover their health...He added that the Old Men no longer had any influence, but that the young men really managed everything. "Witness", said he, "the two sorcerers they put to death not long ago" (15: 53).

In October, the Jesuits' cabin caught fire, and they suspected arson. However,

About this time our bark fleet, I mean the Hurons who had gone down to the French arrived. They all were the most contented men in the world...We saw admirable results from the reception given them at the council that you held at the Three Rivers. They no longer believe, they say, that we caused their death, since they neither saw nor heard anything down there which did not mainly alienate them from their sinister suspicions...It was without doubt the holy Ghost that inspired you to speak with so much profit of our holy Images, which many of them had previously taken for so many demons (15: 55).

Soon after, however, a friendly Huron said, "My Nephews, you are dead men; the Attiguenongnahac are coming to split your heads, while the people of the village are away fishing" (15: 57-59). Another came to say:

Come quickly, and answer to the Council; you are dead men! They found all the Old Men assembled with the Captain who had treated us so badly in the other councils. At first this man spoke to them sharply on the subject of the contagion, the cause of which he attributed to the black robes,

(and to Brebeuf in particular):-

that this wicked man had already profited too much by their ruin, and that therefore a general council was demanded, in order to hear him thereupon, and to end the matter (15: 59).

Brebeuf held a Huron farewell feast and prepared to die. However, the threats stopped: "At all events, since the 6th of November...we have enjoyed an incredible peace, at which we ourselves wonder from day to day, when we consider in what condition our affairs were only one week ago" (15: 67).

New Interpretations of Huron Behavior in 1637

Awareness of the Huron experience of the epidemics and their importance to them in terms of their survival as individuals, families and "country" - provide a broader context for understanding behavior and interpreting events. For example, two instances of Huron behavior formerly attributed to trade motivations can be otherwise explained: their cessation of overt hostility toward the Jesuits in the autumn of 1637 and their not killing any or all of the Jesuits, despite belief in their agency and the threat to survival they represented.

Cessation of Hostility Toward the Jesuits in November 1637

Satisfaction with ongoing trade, the traders warm reception at Three Rivers, and their failure to see anything suspicious or sinister at Three Rivers are cited as explanations for the decrease in suspicion of Jesuit agency in November 1637 (15: 55; Trigger, 1976, 2: 546). However, it is questionable whether material goods - no matter how desired or necessary - would satisfy a people undergoing destruction by the group with whom

they traded. In fact, events at the St. Lawrence suggest an explanation more consistent with Huron feelings and beliefs at the time.

The traders were welcomed, and thanked for coming despite enemy attacks and the continuing epidemic. Every canoe had sick Huron in it; some turned back before reaching the St. Lawrence. Some Huron died and were buried at the St. Lawrence.

The French spokesman said:

...moreover, that we were sometimes afflicted in our country with the same scourges of pestilence by which they are assailed; that then we asked our Fathers, who understand how to pray to God, what must be done to check these maladies; that, if they wished to do the same, they would find it to their advantage; and if at that very moment they would listen to [Father Le Jeune] I would tell them what they ought to do. They answered that they would be very glad to hear me. Thereupon, I drew forth a beautiful picture of our Saviour, Jesus Christ; I uncovered it, and placed it before their eyes. Then beginning to speak, I told them that we were not the masters of life and death; that he whose image they saw was son of the Almighty, - that he is good, that he loved men, that the demons who do so much harm were only his slaves. I said that when we offended this great Captain, son of God, either by stealing, or refusing to believe in and obey him, that he permitted the devils to afflict us; but that, when we had recourse to him, asking pardon for our offenses and promising to be faithful to him, he cured us of our ills and bound the hands of the evil spirits, so that they could no longer injure us. That, if they wished to do the same, I would give this beautiful picture to Pierre Tsiouendaentaha, our Neophyte, to take it into their country, so they could pray this great Captain to have pity on them. They replied that [Brebeuf] told them the same thing that I had just said; that they would talk over this matter with their old men, and that they would all together do what we had recommended (12: 249-253).

After the neophyte preached to them:

they talked among themselves for some time, saying they must heed what was said to them, to profit by it in their own country. Finally our good Christian displaying the little Picture or Salvator that I had given him, exclaimed, 'If we have to encounter any enemies on our

return, let us raise this standard high and all cast our eyes upon it, and we shall be helped' (12: 253).

The Huron were given presents - a barrel of iron arrowheads, a kettle, some peas (12: 257). The captains said:

thou doest what ought to be done; it is thus brothers succor each other in their needs'. The other asserted that all their country would be filled with the renown of the Captain of the French (12: 259).

Thus at the St. Lawrence, the Huron elicited from the French what they had tried but failed to learn in Huronia - specific information about the disease, such as that learned by the arendiwanes from okis. They affirmed that the Jesuits knew about the disease, and learned that Jesus was the Jesuits' oki and that belief in him and proper behavior (e.g., not stealing, praying) would persuade him to protect them from the bad okis causing the disease and to cure them of disease. Moreover they were given a charm - the portrait of Jesus - to prevent misfortunes.

The Jesuits in Huronia believed they were saved by the French at the St. Lawrence confirming their statements, whereas, if the encounter was accurately recorded, they were saved by different statements - at least statements couched in terms more aligned to Huron concepts, providing them with agent, cause and cure of the disease. The council headmen advised waiting for the return of the traders; perhaps he had commissioned them to gain such information if they could.

Why The Jesuits Were Not Killed

Trade-dependency has been cited as the reason why the Jesuits

were not killed: the Huron did not want to endanger the trading alliance with the French (Trigger, 1976). An alternate explanation is fear of a new and therefore strange agent possessing seemingly incontestable power and capable of destroying the country. Moreover, the agency and power may have been perceived as corporate - shared among the Jesuits not only in Huronia but at the St. Lawrence and in France. The murder of one or even all those in Huronia would thus not remove the threat, but might, actually increase it.

The fact that neither the Neutral or Tionnatacé killed the Jesuits, although they feared them and tried to avoid or expel them, supports the explanation based on fear: these groups had no trade relationships to protect.

After 1637

In the winter of 1637-38 the Huron demonstrated a willingness to listen to Jesuit preaching, and young men sought baptism (15: 119, 121, 125). In the summer of 1638 Lalemont

found the minds of the Savages quite tranquil and, as it were, in a condition of regret and repentance for what had taken place, being astonished at their own blindness and lack of sense in holding such umbrage and so evil passions toward persons like us, who had only done them good (17: 115).

However, after the traders returned and Jesuit preaching resumed (and also after sick Wenroronon had introduced more disease to Huronia).

All their complaints and clamors were renewed, - that since we were in the country, and had sown our doctrine there, one saw no longer aught but misfortune and misery, and no more old men were seen; that the whole country was going to decay and ruin; that, after having caused the death of all those in the quarter where we had first

settled, we went through all the other villages to create the same havoc; that, if the cause of all these evils were not suppressed, they would soon see their entire nation annihilated (17: 115).

All these fancies of these poor Barbarians, that we are the ruin and the destruction of their country, increase whenever some new misfortune happens to them, - be it sickness, or famine which [in June was] prevalent in some parts of the country, especially in the village of [Ossossanel], imputing to us all their afflictions, as if we were the cause thereof, or, being able to furnish some remedy for them, we would not do so (17: 119).

When the Jesuits admonished them for seeking cures of demons,

we are declared arraigned and convicted of that which they accuse us, - of intending nothing else than the destruction of and the ruin of the world, since we will not deliver them from their troubles, nor permit them to provide themselves with the ordinary remedies employed in their country from all time against their misfortunes, especially when, in their belief, it is we who are the cause of these (17: 119-121).

Some Huron asked the Jesuits "not to make them linger, but to despatch them promptly, as we have the others" (17: 123).

The Last Epidemic

The smallpox epidemic started the following year. The Jesuits reported:

The death of their nearest relatives takes away their reason, and increases their rage against us so strongly in each village that the best informed can hardly believe that we can survive so horrible a storm (19: 91).

An infected man stabbed himself when cures were ineffective. Men "acted as madmen and lunatics, and exclaimed that they could not bear the sight of" the Jesuits (19: 2213). An important headman, upon seeing Le Mercier, "no sooner had perceived him than he fell into a frenzy which rendered him more like one possessed than a man in anger". He reproached the Jesuits for all their

miseries "in a tone and with an accent full of fury. After all, he takes a glowing firebrand, and approaching the Father, says to him: Resolve not to leave the place; today thou wilt be burned" (19: 175). Rumors circulated that the Jesuits would be or had been killed. Verbal and physical threats continued: a young French boy was nearly strangled and a Jesuit hit on the head to prevent baptism.

It was decided in council in March to kill the Jesuits, but for want of an executioner, and fearing that it would result in the ruin of Huronia, it was decided to kill Huron sorcerers first, to see if that would have effect. A neighboring group was also asked to kill the Jesuits.

Some elders recommended banishing the Jesuits. Lalemont remarked on how easy it would be for them to kill the Jesuits and blame it on sorcery or the Iroquois; however, no Jesuit was killed.

When a Frenchman got smallpox, but recovered, some said it proof that the Jesuits had the secret of the disease; others suspected it was only a French trick - to persuade the Hurons of Jesuit innocence.

The Huron developed a new tactic to avoid French malevolence: believing they were being punished because they did not heed the word of God, they decided not to listen and thus not to hear, so they could not be punished for disobedience. They ran away or covered their ears when the Jesuits spoke (19: 213). The Jesuits should not have been surprised, for despite their protestations of innocence in causing the disease, Lalemont reported and may

have told them God was punishing them with the disease because they would not listen to the Jesuits.

Discussion

Even by 1637, the Hurons believed:

- the epidemic was the most important matter in the country
- Huron preservation was threatened; the current epidemic was different from the previous one - longer and more damaging - and it was continuing
- the damage was unprecedented; so many, including leaders, were dead; families were threatened with extinction
- it was not known how the country could be restored
- the threat continued: Huron powers and actions were ineffective, as they did not know the cause, agent or remedies
- the Jesuits knew the origin, and despite Huron feelings of anger and fear, they continued to try to discover Jesuit secrets.

Huron behavior at the council reflected these perceptions. They displayed fear, anger, despair, helplessness and frustration. Their desire to harm or kill the Jesuits was tempered only by their realization that the Jesuits held the secret to their survival.

Emotional displays continued - perhaps increased - during the smallpox epidemic, which was more disfiguring and caused more fatalities. It was the seventh year of the malevolence which was destroying their country at an ever-increasing rate, and which

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they were helpless to combat.

Findings of studies of disasters identify factors influencing subjective interpretations of the severity of the event. For example, the fact that virgin soil epidemics (at least the first one experienced) is unprecedented increases the effects (Neel et al., 1970). Greatest disorganization follows a disaster when 1) there is no advance warning, 2) it has never happened before, and 3) it affects all parts of the community (Lang and Lang, 1964). All of these characterized the first Huron epidemic, and the last two the second and third epidemics. Fear of the unknown is the worst (Lang and Lang, 1964). There is no cognitive preparation.

A recurring disaster - one which has been experienced before by the present or previous generations - may be feared, but it is mentally prepared for. What it means, how much damage might result, and counteractive and protective techniques and behavior models are known (Lang and Lang, 1964; Schneider, 1958), from personal experience, communications from elders or others, or history. In preliterate societies "mythology encodes, stores and transmits knowledge of potentially dangerous environmental events", and thus represents "an integral and strategic element in the adaptive infrastructure" (Cove, 1978).

On Yap, typhoons recur. Their cause is known (problems in social relationships) as are their nature, effects and remedy; there is little shock experienced (Schneider, 1958). The Huron disasters were unprecedented not only in type but in length and damage suffered. There was no such cognitive preparation.

Much of the war captain's concern in the council of 1637 originated in his fears of the unknown: the damage sustained was already worse than experienced before and he did not know how much longer it would last, what the final damage would amount to, or if or how families would be able to reconstitute themselves, and most of all what the disease represented - its origin and meaning. Brebeuf's reply, that the Hurons wouldn't be able to discover its "origin - that is hidden from you" - enraged him. Ignorance of origin, in Huron terms, meant helplessness in combatting it. Nothing had been found to stop the process and thus their survival was threatened.

Psychological studies suggest that stress experienced by groups increases in intensity and duration if they can't stop or control or protect themselves from the cause (Lazarus, 1966). Psychological analysis of the Huron is ill-advised, bearing in mind Evans-Pritchard's (1965)-warning that western psychological findings cannot be applied to non-western peoples. It does appear, however, that Huron perceptions of ineffectiveness increased their fear.

The duration of the disaster may also have contributed to their fear. During an extended disaster, people must cope not only with the damage already done, but also with the continuing threat (Lang and Lang, 1964). Fear is cumulative, and tensions increase (Lazarus, 1966; Lang and Lang, 1964). That the epidemic experience was unprecedented (at least in degree and origin), uncombattable, and seven years long and continuing thus may have intensified Huron fears for their continued existence.

Fears of their enemies' completing the ruin, with or without Jesuit assistance, continued after the epidemics (21: 75-77).

Huron Assessment of Depopulation

The term used by the Huron for the destruction of their country was "ruin". The ruin was being accomplished in several ways (e.g., deaths, loss of power and luck, misfortunes) but the indicator of ruin was deaths - individual and cumulative, leading to extensive depopulation of villages.

Families were being ruined (19: 91) and villages too: Ihonataria - its inhabitants dead or scattered - and Ossossané - greatly depopulated by disease - were accounted "ruined" (19: 91, 217). "Our country is ruined", a Huron told the French at the St. Lawrence in 1637: "...they are all dying in our villages and along the way" (12: 243-245).

Elders and captains were dead. The war captain at the council in 1637 was the last of the leaders of his group. Even before the smallpox epidemic, the Huron complained that there were "no more old men to be seen" (17: 115). Lalemont remarked in 1640 that there remained "only very few old men, very few persons of skill and management" (19: 127). In 1637 the Jesuits were told that the young men were making the decisions (although this may only have been intended to frighten them).

Families were greatly reduced (e.g., that of the old war captain in 1637 to two) and many children died (18: 23; 19: 211). By 1639 the Huron were preferring female infants because they would help repopulate the country (15: 181-183). (Algonkin at the St. Lawrence at this time were described as loving children

"above all things" and being desolated at their deaths (16: 17); one family was reluctant to give their daughter to the French because they feared their relatives' censure (16: 67-69)).

This accords with data from modern virgin soil epidemics, which show a higher proportion of deaths among the young and the old, in smallpox epidemics and from pneumonia, (Millar, 1977; Taylor and Knowelden, 1964).

Sagard noted the importance of children to the Huron in 1624 (Wrong 1939) and thus it was not a new development; but their importance may have increased following the deaths of so many and the Huron preference for females may have been new, just as Algonkin grief at their children's deaths may have increased during the epidemics.

Capability to Restore Population

As noted above, even by the second epidemic the extent of depopulation was perceived as unprecedented and perhaps irreversible, and their ability to regain original population levels was being questioned. Some families feared extinction. The feared inability to restore numbers naturally was also expressed by old Neutral women in 1640 who, when they saw the Jesuits (agents of the disease) arrive, "considered themselves as already lost and only regretted their grandchildren who might have been able to repeople the land" (21: 221).

Fear of diminished numbers related to their image of a strong and prosperous country, but also and of more immediate concern, to their position vis-a-vis their traditional enemies. The plight of other disease-weakened groups was known. To

survive, the Wenroronon were forced to move and join a larger group - the Huron - in 1638. The French at the St. Lawrence noted in 1644 that disease, famine and war had "so greatly thinned the numbers of our savages that, where eighty years ago one could see eighty or a hundred cabins, barely five or six can now be seen; a Captain, who then had eight hundred warriors under his command, now had not more than thirty or forty; instead of fleets of three or four hundred Canoes, we see now but twenty or thirty" (25: 109), and the Algonkin complained they were now so weak they could only retreat from enemy invasions.

Various other Algonkin groups had lost the use of their traditional territories through fear of their enemies, and wintered at Huronia, at the St. Lawrence, and other places. In 1644 a Kichesipirini described the fate of his group: "Some years ago, you saw the Algonquins in such numbers that we were the terror of our enemies. Now we are reduced to nothing; disease has exterminated us; war has decimated us; famine pursues us, wherever we go" (26: 303).

Although warfare was not reported to be as intense during the epidemics in Huronia as afterward (which may partly reflect Jesuit preoccupation with baptisms) blood-feud warfare was the context of Huron external relations and thus continued to occupy their thoughts. For example, in 1637 they discussed military matters before epidemic ones - this at the height of the worst epidemic ever experienced.

A rumor circulated after Brebeuf's visit to the Neutral in 1640 which perhaps reflects fear of destruction by their enemies

following depopulation. The rumor was that Brebeuf had visited the Iroquois and had told them that the Jesuits had killed many Hurons with prayers and charms, but that Iroquois attacks were needed to complete Huron ruin (21: 75-77).

By 1640 Lalemont believed their fears groundless, as enemy attacks had not materialized (19: 83).

Their vulnerability as a diminished and ill population - both in the immediate and more distant future - was apparently worrying. Rumors of imminent enemy attacks occurred during and after the epidemics - Lalemont's expression of concern about the Huron's (and thus the Jesuit mission's) ability to survive in the face of Iroquois attack, after being so weakened, was expressed in the context of a plea to Cardinal Richelieu for French action against the Dutch, who he believed were inciting Iroquois attacks. Thus his opinion cannot be taken at face value. However, depopulation was so extensive that the Huron feared total ruin - in Huron terms; death and dispersal - by their enemies and/or the Jesuits.

Thus some epidemic effects of concern to the Huron included:

- greatly decreased family size,
- great losses among children and leaders,
- diminished powers in all fields, and
- loss of strength versus the enemy, rendering them vulnerable to attack and ruin.

Most of these concerns seem to have been shared by neighboring northern groups and, it is assumed, by affected Iroquois ones (although degree of perceived vulnerability would have depended

on Indian estimates of extent of depopulation of different groups). These concerns were of major importance, as survival - both individual and group - were at stake. Thus, it would be expected that these concerns would continue, and affect behavior following the epidemics.

Elsewhere, epidemics resulted in an increase in adoptions of captured enemy individuals. As adoptions were a traditional response to war depopulation in the northeast, it can be predicted that a similar response would occur there. Whether the desire to increase captures in order to increase family and group size following epidemic depopulation was responsible (at least in part) for the increase in warfare in the 1640's will be tested in the following chapter.

CHAPTER 4

CAPTURE RATES AFTER THE EPIDEMICS

Elsewhere, groups depopulated by epidemics increased adoption of captives to enlarge their groups. Consider this description of a Piegan smallpox epidemic taken from David Thompson's Narrative of his Explorations in Western America, 1784-1812 (1916). The Piegan contracted the infection from their enemy, the Snake, during an attack. An elder said a malevolent spirit caused the disease because they would not stop fighting. During the epidemic they forgot about fighting, having enough to do just getting food. Afterward, they might have made peace with the Snake, but the Snake had moved somewhere else.

After the epidemic they did not fight for three years, ignoring any enemy they saw. They waited for their young men to grow up. The third winter, the Snake attacked. As the Piegan prepared to counter-attack an old man cautioned them that:

...the young women must all be saved, and if any has a babe at the breast it must not be taken from her, nor hurt; all the Boys and Lads that have no weapons must not be killed, but brought to our camps, and be adopted amongst us, to be our people, and make us more numerous and stronger than we are.

This, "while it weakens our enemies makes us strong" (p. 339).

In the northeast, capture and adoption of enemy women and children was common practice in the blood-feud warfare (6: 259). Males old enough to fight were usually killed, as were the old, the sick, and those unable to keep up with the group. Captors

kept women and children or distributed them to those whose relatives had been killed. "And of this experience I have seen many instances", Sagard reported in the 1920's (Wrong, 1939: 159). Captives were transformed into countrymen by the very process of capture; by, the Mohawk said, the "right of war" (21: 45).

The French remarked on the extent to which captives were accepted and loved following adoption (6: 259; Wrong 1939). Captive children forgot their language, and warriors fought their former nations. Thus were individuals replaced, families restored, and the future population increased by the reproduction of enemy women. Captures strengthened the families and nation, while weakening those of the enemy.

Unlike the Piegan case, for the northeast there is no recorded statement that captures were made to restore numbers after epidemics. However, Champlain recorded a statement that may link epidemic deaths and warfare. In 1611, members of an Algonkin group met Champlain at the St. Lawrence later than planned, and in fewer numbers, "inasmuch as one of their chiefs and many of their tribe had died of a fever which had broken out among them. Moreover, they had sent many braves on the warpath" (Biggar, 1922-36, 2: 207). Since first contact with Champlain at Tadoussac in 1603, Algonkin, Montagnais and other groups had been fighting their common enemy - the Iroquois - and soliciting French help against them. Thus a war party in 1611 was not to be unexpected, although in the past two years this group had joined the French to attack the Iroquois. However, the phrasing of the account (although it may not have

been that of the Algonkin spokesman) may represent a connection between epidemic deaths and attacks against the enemy.

In 1645 the Jesuits report that a war party of headmen from Acadia passed Miscou "on their way to war...They threw themselves on the first prey that fell into their hands; they came back victorious, and desired by these massacres to allay the grief and sorrow of all the Country, which is afflicted by the death of many persons who have died during the past few years..." Some of them stopped at Miscou on their way back: "They came to rejoice with our Savages at the brave exploits of the war that they had performed at Chichedek, in the Country of the Bersiamites, where they had killed seven Savages and taken thirteen or fourteen prisoners, most of whom were children..." (28: 33-35). (The Bersiamites inhabited the north shore of the St. Lawrence River, below Quebec).

The Acadian deaths precipitating this action could have been war deaths: local wars were occurring (e.g., 28: 205) and fears of Iroquois attacks were expressed. However, there had been epidemics in the northeastern maritime areas between 1634 and 1641 (Stearne and Stearne, 1945). The 1639 St. Lawrence smallpox epidemic was thought to have originated with the Abenakis. There are reports of contagious diseases in the Miscou region after 1635 and "some years" before 1643 (32: 43). In 1645 the Abenakis suffered an epidemic which "destroyed a good part of their nation" (28: 203) and in Tadoussac many died. Many Abenakis were ill in 1646-47 (31: 241).

Thus, the attack on the Bersiamites could have been a

response to epidemic rather than war deaths - an attempt to restore family and group size by substituting enemy children for those who died in epidemics.

However, for the northeast, the data presented in support of the hypothesis are indirect.

Table B indicates epidemic periods in the northeast. Capture data are presented for the Neutral, the Huron, the western Iroquois, the eastern Iroquois and the St. Lawrence Indians. This is followed by supplemental evidence based on reported intentions, treatment of captives and nature of war parties.

TABLE B: Years of Epidemics in Various Areas of the Northeast.

<u>Date</u>	<u>Eastern Iroquois</u>	<u>Western Iroquois</u>	<u>St. Lawrence</u>	<u>Huron area</u>
1634	X X	? ?	X X	X X
1635				
1636	? ?	? ?	X X	X X
1637				X
1638	?			X
1639			X X	X X
1640	? ?	X X		
1641				
1642				
1643				
1644				
1645				
1646	X X	? ?	X	
1647				

Data Problems

The shortcomings of the Jesuit Relations and Allied Documents have been noted. Problems include discrepancies between accounts, their anecdotal nature, and the different purposes of the numerous authors (Brown, 1970).

Outside of a few letters and the St. Lawrence Jesuit Journals (meant for Jesuit perusal only) for a few years, the data consist of the Jesuit Relations - reports from the missions to the hierarchy in France and Rome, edited both in Quebec and in Europe, and published to increase public interest in and recruitment for the missions.⁵

There is also a summary, published by Bressany for Italian Catholics, of twenty years of the mission in New France (Thwaites, 1959, vol. 38 and 39).

Because observers usually stayed near the missions, disease data are best for mission areas, less complete for known but rarely visited groups - such as the Tionnataaté and the Neutral - and sparse for the Iroquois. Only two epidemics are reported for the last, and those from one nation only.

War data are also uneven. Huron, Algonkin and Montagnais war parties, if known about, are mentioned, but often the results of the sorties are not reported, and perhaps not known. Sometimes the French were aware that males were absent, but the effects of war parties on Iroquois settlements and surrounds

⁵Jesuit missionaries increased from 1000 in 1556 to 13,112 in 1615, and to nearly double that in 1750 (Morner, 1965).

are unreported (although encounters with war parties are mentioned), whereas Iroquois attacks on northern groups were learned and recorded. Likewise, treatment of captives by the Mohawk is better known than that by northern groups, as released French and escaped Indian captives' stories are recorded. It is unknown how representative the Mohawk were of other Iroquois groups.

During epidemics the Jesuits were preoccupied with disease, baptisms, and Indian hostility towards themselves. Thus they may have omitted war parties and captures in their accounts. They may even have suppressed accounts of Huron captives during the 1640's because of political considerations (see below p.103).

The Neutral

From 1638 to 1641 the Neutrals suffered disease, famine and war (21: 191) (Table C). They had two consecutive years of famine just before the 1639-40 smallpox epidemic. As stated above, in 1640 they were concerned about restoring their population.

Numbers of pre-epidemic captures per year by the Neutral are unknown. During the summer of 1640 they captured 100 (24: 195). In 1640-41, an important headman and other men were away all winter. Over 170 captives were brought home in 1641 (and the Jesuits reported that the Neutral burned women as well as men) (21: 195). In 1642, 2000 Neutral warriors destroyed an enemy village defended by 900 warriors, burned 70 warriors, blinded and stranded the old men, and brought the rest of the 800 captives home (27: 25).

TABLE C: Years of Neutral Epidemics and Captures.

<u>Date</u>	<u>Disease</u>	<u>Captures</u>
1638	{ Disease, famine and war	
1639		
1640	{ Smallpox	100
1641		170 plus
1642		800

The Huron

The timing of Huron epidemics, captures and war parties are shown in Table D.

More captives are reported for the 1630's than the 1640's, and they were warriors, said to be tortured and killed. The practice of integrating enemy women and children into Huron families is reported both for the 1620's and the 1640's, and the Relation for 1640-41 reports that the Huron either killed women and children immediately or let them live (21: 195).

However, although Huron warriors went out every year except two between 1634 and 1648, the only mention of enemy adoptees are:

- 1) an Iroquois woman, "...a young woman about twenty-five years of age, whose life the Hurons had spared"
(mentioned in reference to her escape attempt in 1648)
(33: 109);
- 2) an Iroquois man, "Who had formerly sojourned a very long time here, a captive among the Hurons, and had become naturalized with them, but within these last years had

TABLE D. Huron Epidemics, Captures, and Years of War Parties.

<u>Year</u>	<u>Epidemics</u>	<u>Captures</u>	<u>War Parties</u>
1634			X (defeat by Seneca)
1635	X X X		(Men away, war not specified)
1636		8	X (met enemy on own frontier)
1637	X X X		X (Or 1638?)
1638		80 7 13	X (with Algonkin) X (or 1637?) Some at St. Lawrence
1639		12	XX (elders captured)
1640	X X X	1 Some	X (ambushed) X (Lake Ontario)
1641		Some	XX (nearly all failed)
1642		A few raiders, caught in Huronis	X (went west; outcome unknown)
1643			X
1644		3	X (60 at the St. Lawrence)
1645			X (raid on Seneca, revenge) X (away 2 months)
1646		Some	XX? (captives, spoils)
1647		Some	X (own frontier)
1648		1	X (St. Lawrence) X

- been recovered by the enemies" (29: 251, in 1646); and
- 3) two "young men of the Nation of Fire ... both captives of war, who having been taken when quite young, have been preserved alive" (30: 91, in 1647).

Furthermore, mention of any captives in the 1640's, or their treatment, are few and vague, e.g., the 1646 report:

Our Hurons too have had, in their turn, success in warfare, have put to flight the enemy, and have carried off their spoils and some number of captives; these have served as victims to their flames...I speak not of various massacres which have occurred on both sides, in secret, as it were (29: 247-251).

It is possible that the Huron made few captures in the 1640's.

As for integration of captives, either

- 1) the Huron did not capture and/or adopt enemy women and children, or
- 2) they concealed the practice from the Jesuits (perhaps because the latter, insisting on monogamy, would have disapproved of replacing captured but living Huron wives with enemy women), or
- 3) the Jesuits were not interested in captives unless they were to be killed, and thus required baptism (although had this been the case, warriors would have been described in the 1640's), or
- 4) the Jesuits chose not to report it.

Presumably the Huron did capture enemy women and children, as their warfare was extensive and, by Jesuit reports, sometimes successful. Concealment would have been difficult, if the traditional practice of welcoming enemy captives outside the

villages and parading and displaying them in the villages were continued. If these practices were abandoned, enemy adoptees could perhaps have been integrated in many families without Jesuit awareness.

Jesuit silence about integration of captives may relate to political considerations. Depicting the Huron as beleaguered and passive - fighting only in defense or to avenge Iroquois cruelties - would have helped to sustain or gain sympathy for the Huron, and economic and military support for their mission. Captures by Huron of enemy women and children might have been viewed by Europeans as provocative and as contributing to the problem.

The Huron may not have captured as many as the Iroquois in the 1640's, but it is unlikely that they would not have continued traditional practice. The assumption that Huron warriors, who went to war almost every year, captured at least some women and children seems reasonable. However, quantitative data are lacking.

The report of a Christian war party who went west in 1642 did not include the outcome of that sortie, although the non-Christian party, who fled from the enemy, was described. Adopted captives of the Fire Nation are mentioned twice in 1647 and could represent captures made there in 1642 by the Huron. Jesuit omission of that war party's experiences, regardless of whether captives were acquired, may exemplify the selective reporting which resulted in so little capture data for the Huron.

Jesuit reports do include the admission of Wenroronon and other remnants of groups (19: 127). This strategy - the

amalgamation of small groups for greater strength versus the enemy - was traditional in the northeast, and was being practiced by non-sedentary groups at this time. Reports of accepting refugees may have been expected to bolster the Huron image in Europe, and were thus included.

The Iroquois

Iroquois Epidemics. Two epidemics were reported for the eastern Iroquois: a "smallpox" epidemic prior to December 1634 in at least two of the villages nearest the Hudson River (Anon., 1909) and an unspecified disease beginning in the summer of 1646 and continuing through the spring of 1647 (30: 271).

Another may have occurred in 1636-37, as it was rumored in Huronia that a single agent had caused epidemics among the Susquehannock, the Mohawk and the Huron. Stearne and Stearne (1945) report a Mohawk epidemic in 1637-38 (source not given).

Eastern Iroquois warriors could have contracted enemies' diseases during warfare:

- 1) in the St. Lawrence area in the winter of 1636-37;
- 2) when they ambushed a Tadoussac war party in Mohawk country in April 1637 (12: 153-159); and, most probably,
- 3) when they captured 29 Huron on the St. Lawrence in the summer of 1637, when almost all the Huron traders were ill (12: 199, 209, 215, 231).

Thus a 1637 (or a 1637-38) epidemic could have occurred among the eastern - and subsequently other - Iroquois.

Similarly, although a smallpox epidemic was not reported

between 1639 and 1641, they could have been exposed to the disease during their attack on Algonkin near Three Rivers in the summer of 1639 (16: 51, 65, 213). Jogues, a Jesuit captive in Mohawk country from 1642 to 1643, baptized 70 children and adults "most of whom are in heaven" (25: 73) and 60 dying children in "confederate" nations to which he was taken (39: 229). These illnesses could have represented normal incidence but they may have represented an endemic stage of the disease.

The only epidemic recorded for the Seneca (or any western Iroquois) occurred in 1640-41, but they had potentially contaminating contacts:

- a) with a peace embassy from Huronia, which left Huronia after the 1634-35 epidemic began there (8: 117);
- b) in 1637, when a man from the Senecas came to Huronia, perhaps in connection with the Seneca-Huron peace talks (14: 39); and if the mid-summer war council at the peak of the epidemic sent a Huron embassy to the Seneca (15: 37);
- c) when they may have attacked the diseased Wenroronon, who subsequently moved to Huronia in 1638 (17: 27);
- d) when they captured the elder members of a Huron war party in 1639-40, the year of the Huron smallpox epidemic (20: 75, 79);
- e) when some sort of Huron-Seneca contact resulted in the capture of a Seneca by the Huron in spring of 1640 (18: 29).

Either of the last two contacts may have introduced the small-pox epidemic of 1640-41.

It is probable that more epidemics than those reported occurred among the Iroquois, and that reported and unreported infections spread to other Iroquois nations in the same ways transmission occurred in Huronia, although the greater distances between nations may have resulted in less dissemination than in Huronia.

The Western Iroquois. The western Iroquois nation most commonly named in attacks on Huronia were the Seneca, but the Onondaga and Cayuga also attacked. During the 1634-38 Seneca-Huron truce, fighting continued with the others. In 1647 the Onondaga had 100 Huron captives (33: 123).

Table E shows, for 1634-39, periods when epidemics contracted from the Huron (but not from other sources, such as eastern Iroquois nations) were possible, and times of captures, war parties, and fears of enemy attacks in Huronia.

There were a few reported captures in the 1630's. Either few Huron were captured or the Jesuits were unaware that they had been. Huron fears of attacks occurred frequently. This may indicate a) enemy activity and proximity (although the Jesuits did not usually think so) or, b) that fears of attack were normal in the context of this blood-feud warfare, or c) that the Huron felt weak and vulnerable following epidemic illness and depopulation and thus feared the results of enemy attacks.

TABLE E. Possible Epidemics (Contracted from the Huron),
Captures, and War Parties of the Western Iroquois
and Fears of Attacks in Huronia, 1634-39.

<u>Year</u>	<u>Epidemic</u>	<u>Captures</u>	<u>War Parties</u>	<u>Fears of attacks in Huronia</u>
1634	?	100 warriors (killed most)		
1635				X
1636	?		X (on Huron frontier) 4 found in fields, in ambush	X
1637	?			X
1638	?			Huron dread of Iroquois, constant alarms (17:17)
1639		Elders of a Huron war party (killed?)	X	(continual fear of enemies, lest they carry off villages (19:83)
1640	?			

Table F shows western Iroquois epidemics, captures in Huronia, the volume of warfare in Huronia and seasons of Iroquois presence around Huronia between 1640 and 1649. By the summer of 1641 the paths in the more southern and eastern parts of Huronia were reportedly dangerous because of the enemy's presence (27: 29-31). A Huron war party intercepted and scattered a group of 300 Iroquois warriors near the Huron frontier.

By 1642 the enemy were everywhere in Huronia, for most seasons of the year. They destroyed a Huron village and only twenty escaped death or capture (26: 175). (The Jesuits' report that all had been killed may reflect ignorance, at this time, of usual practice and of what really happened - see below p. 124). The report may also have been intended to demonstrate Iroquois barbarity at a time when the Jesuits were sending representation to Europe to solicit political and military assistance in stopping Iroquois attacks (22: 269)).

In the fall a group of 40 Huron gathering hemp were attacked: "During the night, while they were sound asleep, about twenty Iroquois fell on them, massacred some, and took the others prisoners; a few, more fortunate, escaped by flight" (26: 205).

Smaller attacks were numerous. Almost throughout the year "various parties of the enemy, who have crept into the country under the cover of the woods and of night, have everywhere and at almost all seasons of the year committed massacres which are all the more to be dreaded since no one feels safe from them. Even women, and children at the breast are not in security within sight of the palisades of their own Villages" (22: 305).

TABLE F: Years of Western Iroquois Epidemics, Captures in Huronia, and Volume of Warfare in Huronia, and Seasons of Iroquois presence, 1640-49.

<u>Year</u>	<u>Epidemics</u>	<u>Captures</u>	<u>Volume of Warfare</u>	<u>Seasons Present</u>
1640	Smallpox			
1641			Increasing	
1642		Frontier village 40 (work party) Many individuals	Increasing	Increasing
1643		100's captured 100 warriors (captured and killed)	Increasing	Increasing
1644			Approached to attack village, but did not	
1645		Work party		
1646	Epidemic spread from Eastern Iroquois?	(Village almost destroyed?)	Approached to attack village, but did not	
1647		(Neutral village)	300 Onondaga, 800 Seneca and Cayuga	
1648		24, 71 2 villages (700 killed or captured?)	1000 or 1200 in war party	Increasing
1649		2 Huron villages Many while dis- persing (Tionnataté village)	Increasing	Increasing

"...throughout the whole summer, there was nothing but fresh rumors of massacres happening one after the other, in the heart of the country, and close to the villages that were most remote from the enemy; and yet it was never possible to capture more than two of these Adventurers, who, having pushed ahead too recklessly, were surprised in their ambushes" (26: 179).

In September of 1643, Lalemont reported "The scourge of war, that has hitherto carried off a great number of these tribes, has continued to such an extent for a year past, that one may say that this country is but one scene of massacre" (26: 175). During the summer, "War continued its usual ravages...There was no less desolation throughout the country. Nearly every day, unfortunate women were killed in their fields. The villages were in a state of continual alarm, and all the troops that were raised in good numbers to pursue the enemy over the frontiers were defeated and routed; captives were taken by hundreds, and frequently we had no other couriers and bearers of these dismal tidings but poor unfortunates who had escaped from the midst of the flames..." Famine necessitated trips to gather acorns and roots "very far away, in places where they were exposed to massacre and which were covered only by the enemies' tracks" (27: 63-65).

Little is known about attacks in or near Huronia in 1644. By May 1645 Huronia "and all these countries" were reported to be weaker all the time" (28: 43). Lalement complained that Iroquois "insolence grows from year to year; who depopulates the country, and makes our Hurons think of giving up the trade

with the French, because they find it costs them too dear, and they prefer to do without European goods rather than to expose themselves every year" (28: 57).

"At the beginning of spring, a band of Iroquois - having landed near one of our frontier villages, by favor of a very dark night, and having concealed itself in the woods - surrounded a company of women who were just going out for work in the fields, and so quickly carried them off in their canoes, that two hundred men in arms, who ran up at their first cries" could not save one (29: 249). An Iroquois war party approached Teanaostaiaé, but the Huron expected them and they did not attack (29: 251). The French at the St. Lawrence heard in the spring of 1646 that Onondaga and Oneida warriors had nearly destroyed a frontier village; this may have been in reference to their approach to Teanaostaiaé (29: 149), or to another incident.

From 1646 on, little mention is made of widespread small-scale attacks: the reported war activity was by large, sometimes multi-nation groups of Iroquois. Large groups appeared in 1644 and 1645, but did not attack. A total of 1100 Iroquois (300 Onondaga, 800 Cayuga and Seneca) planned a joint attack in 1647; at the withdrawal of the Onondagas (who had begun peace talks with the Huron), and at the apparent decision not to attack Huronia, 300 Seneca attacked the Neutral - formerly non-enemies - "where they took away all the captives they could" from a village (33: 81-83).

In 1648, at the end of winter, a Huron work party was attacked, first by the Seneca and then by the Mohawk: 71 were

killed or captured (33: 83-89).

In July 1648, Teanaostaiaé - with 400 families - and another village were attacked while the men were away raiding, trading and hunting. The villages were burned and 700 were killed or captured, mainly women and children. A greater portion escaped (33: 259; 34: 87-99).

In March 1649, 1000 Iroquois killed or captured 400 at St. Ignace, and some others at St. Louys (from which 500 had fled, having been warned). They burned the village and those unfit to travel - the old, the sick, the children and the severely wounded (34: 127). Following a battle with Huron warriors, they left, taking food from St. Ignace for the journey (34: 131).

Killings and captures continued all summer, as the Huron dispersed (35: 83). In December, the Iroquois burned a village of 500-600 Petun families, while the men were away, taking many prisoners. The retreat was rapid, because they feared the men would return and give chase; the weak, the old and children unable to keep up were killed along the way (35: 107-113).

The apparent drop in civilian captures between 1644 and 1646 may not indicate a decreased desire for them but may represent:

- 1) lack of success: the 1645-46 attempt on Teanaostaiaé failed, it was said, because of Huron preparedness;
- 2) Jesuit preoccupation with other matters in their reports; or
- 3) epidemics in western Iroquois villages as well as in

eastern ones.

In sum, noncombatant captures and increased attacks by western Iroquois occurred during the two years following the 1640-41 Seneca epidemic, and again in 1646-47, following the Mohawk (and perhaps other Iroquois) epidemic.

The Eastern Iroquois. Table G indicates times of epidemics (both reported and suspected), large captures and small captures from 1634 to 1648.

The Huron made no mention of Iroquois along the route to the St. Lawrence in 1633 or 1634, during (or before and during) the first recorded Mohawk epidemic. The following year seven Algonquin canoes were captured. There was little war activity by the eastern Iroquois between 1638 and 1640 (although the Algonkin and Montagnais at the St. Lawrence feared attacks). In 1641 there were some small captures, and in 1642 the first large-scale captures of noncombatants and a great increase in small captures both that year and the next.

It seems probable that the eastern Iroquois experienced epidemics sometime between 1637 and 1641 (the capture of sick Huron in 1637 being the likeliest known source of infection), and perhaps the low level of war activity in 1638-1640 at least partly reflected this.

From January until autumn of 1640 there were no Iroquois attacks (18: 91). However, 90 Iroquois wintered near the St. Lawrence and captured two Frenchmen. In the summer of 1641 the Iroquois approached Three Rivers to discuss peace with the French. The talks ultimately foundered, however, because of

TABLE G: Years of Eastern Iroquois Epidemics, and Large and Small Captures, 1634-48.

<u>Year</u>	<u>Epidemics</u>	<u>Large Captures</u>	<u>Small Captures (some killed)</u>
1634	X X X		
1635			7 Algonkin canoes
1636			
1637	?		29 Huron 4 Huron Some Montagnais and Algonkin in Mohawk area
	?		
1638			Some Algonkin?
1639			Some Algonkin
1640			1 Algonkin Algonkin
	?		
1641			2 French 5 Huron canoes 2 Algonkin
1642		Kichispirini group 2 Iroquet families	4 French 23 Huron 11 Huron canoes

TABLE G (cont'd.)

<u>Year</u>	<u>Epidemics</u>	<u>Large captures</u>	<u>Small captures. (some killed)</u>
1643		22, unnamed group	2 French 23 Hurons 8 Algonkin 20+ Huron 9 Huron canoes 3 Algonkin and 1 Huron 3-4 Huron
1644			2 French Some Huron Some Algonkin 2 French Some Huron
1645			
1646			4 Huron.
1647	X X X X X	100 Algonkin 30 Algonkin families	2 Huron 6-7 Algonkin 2 French 1 Huron 2 Huron 3 Huron 4 Huron
1648		40 Huron	2 French 2 Huron 12 Algonkin

their hostile behavior toward Algonkin and because an Algonkin woman, formerly a Mohawk prisoner, said the Iroquois wanted peace with them in order to "take all the Savages, our confederates, ruin the whole country, and make themselves absolute masters of the great River" (21: 37). The Frenchman who had been captive said "they had deputed him to speak concerning peace with the French, but not with the Savages - the Algonquins and the Montagnais, whom they hate unto death and whom they wish to exterminate entirely" (21: 37). The Governor concluded "that the fear of French arms made them desire peace with us in order that they might be able to massacre with more liberty, even before our eyes, the tribes which are our confederates" (21: 49). The Abenakis corroborated the warlike intentions of the Iroquois that summer, saying they "breathe only war" (21: 67).

The first reported large-group captures occurred the next winter and spring. In late winter 1642 the Kichesipirini were attacked by an Iroquois party who had travelled up the frozen Ottawa River to their island camp (the first time the Iroquois had ever ventured there) (22: 253). They "killed those whom they first met and took away alive as many as they could to their own country" (22: 249). A woman who later escaped said "Some who were awakened by the noise, and tried to defend themselves, were at once slaughtered" (22: 253). The other men, women and children were bound. At dawn they left for Iroquois villages. A woman unable to keep up was killed, as were two three-month-old infants (22: 255). At the Iroquois villages,

"...they killed only the men and the more aged women, sparing about thirty of the younger ones in order that they might dwell in their country, and marry as if they had been born there" (22: 265). Presumably the children were also kept alive.

The numerous captures of small groups from 1642 to 1644 included those of Huron traders, some of whom were kept alive. Iroquois warriors were in the St. Lawrence-Ottawa River area in small parties but in great numbers and for much of the year. The St. Lawrence Indians' fears increased (24: 101). The Iroquois were described as attacking "indifferently upon the Montagnais, the Algonquins, the Hurons and the French" (24: 273). By 1643 the Iroquois were reported as having "every winter for some years past...been hunting men in these vast forests; " causing the Algonquin to abandon hunting areas and winter with the Huron (27: 37). By 1644 depopulation by disease was said to have been followed by depopulation by war (25: 107).

Peace negotiations began again in 1645. The Mohawk secretly told the Governor they would stop attacking the French and Hurons if the French would stop protecting the Algonkin (28: 140; translation from the Latin, 28: 215, note 16). Talks continued over the winter and no attacks occurred, but the Algonkin feared the Governor had made a peace without them. Hostilities resumed in the fall of 1646.

The second period of large-scale captures occurred that winter and in spring. The Mohawk had had an epidemic that winter. An escaped captive said they were "afflicted with a general malady, which causes a great number of them to die.

It is the custom, when any one dies in their cabins, to mourn for him a very long time: now, as I was adopted by a family attacked with that disease, we did nothing but weep every day" (30: 273).

Nevertheless, 2 hunting bands of Algonkin, numbering about 100, were attacked in March near the St. Lawrence: "As soon as the conquerors had caused the conquered to give up their arms, and had fast bound those who were likely to escape, they throw themselves upon the old men, the children, and the women, who were not able to follow them" (30: 237). Not all of the women were killed, however. When they reached Iroquois villages, the captives were put on two platforms, one for men and one for women. The women, girls and 2 young boys were spared. "As for the men and the youths able to hurl a javelin or a lance, they were distributed through the various villages in order there to be burned, boiled and roasted" (30: 243).

In spring, when 30 Algonkin families had gathered at the Kichesipirini's island, to go to the St. Lawrence, a Huron led an Iroquois party to their camp. Many were captured. The Iroquois were reportedly so delighted with the furs and goods that some were able to escape (30: 289). Captures of small groups resumed as well, and in January 1648, Mohawk warriors attacked a hunting party of 300 Huron outside Huronia (their first reported attack upon Huronia) (33: 125).

Both periods of large-group captures followed breakdowns of peace negotiations between the Mohawk and the French and their allies. In both cases the Mohawk had sought the end of French

protection of the Algonkin, their traditional enemies. It is possible that the 1642 talks were intended to make captures of Algonkin and even Huron, (perhaps desired as captives after epidemic depopulation) easier.

Jogues, reporting what he had learned during his year of captivity in Mohawk villages, said

...the design of the Iroquois, as far as I can see, is to take, if they can, all the Hurons; and having put to death the most considerable ones and a good part of the others, to make of them both one people and only one land (24: 297).

He also said that a band of warriors leaving Mohawk country, led by a naturalized Huron who had captured Jogues the year before, "desires and proposes to take some French, as well as Algonquins" (24: 295-297). In a letter to a superior in France he described Iroquois parties who, "seizing every year the highway, take many prisoners" (39: 177).

If Jogues' letter was circulated among the French in North America, his interpretations were not reflected in their reports. The Relations refer to extermination (21: 37) but rarely, until later in the decade, the integration of captives.

The 1645-46 talks and near cessation of attacks ended in the summer or fall of 1647 because, the Dutch reported, the French were suspected of causing disease and crop failure in Mohawk country. The second set of large-scale captures occurred 6-9 months later, before the epidemic had ceased.

Other factors may have influenced volume and timing of eastern Iroquois warfare in the 1640's, but the large captures of Algonkin, and the integration of the women and children

followed epidemic depopulation in 1646-47, and probably before 1642 as well.

St. Lawrence Indians

There are few reported captures of enemy noncombatants or even sorties into enemy areas where such captures might have been accomplished (Table H).

Montagnais Indians from Tadoussac attacked the Bersiamites in 1635 following their first epidemic (8: 41) and in July 1636 attacked a fishing party of 300 Iroquois at Lake Champlain. They killed 28 and captured 5; although they wanted to capture more, speed of retreat made that impossible (9: 251-255). In April 1637 they went to Iroquois country, with some Algonkin, but were ambushed there (12: 153). Again, in 1647, following their 1646-47 epidemic, they went up the St. Lawrence to fight some Iroquois (warriors, probably) with the French and some Quebec Indians (30: 181).

In 1643 two Algonkin parties went to Iroquois hunting areas to attack them (22: 53): one was defeated, and the other brought back only scalps. The only other civilian captures described were those of the Bersiamites in 1645 by the group from Acadie, described above.

War parties are mentioned for almost every year, but destinations and outcomes are not always described.

The first epidemic and the almost continual disease at the St. Lawrence between 1636 and 1640 resulted in great depopulation, followed by dispersal from traditional subsistence areas by many groups and fears of others to utilize theirs,

TABLE H. Years of Epidemics, War Parties and Captures for
Ottawa River and St. Lawrence Groups.

<u>Year</u>	<u>Epidemics</u>	<u>War Parties</u>	<u>Captures</u>
1632		Algonkin	9 (from earlier party)
1633			
1634		Montagnais to Bersiamites	
	X		
	X		
1635	X	Kichesipirini	1
	X		
	X	200-300 meet at Richillieu River to go to war	
	X	Montagnais (Lake Champlain	
		Petite Nation	5 (3 non-combatants)
1636			
	X		
1637	X	Montagnais and Algonkin, to Iroquois country	
	X		
	X	Iroquet, on river	
1638		Algonkin (with Huron) (Huron at war at St. Lawrence)	80
1639			
	X		
	X		

TABLE H (cont'd.)

<u>Year</u>	<u>Epidemics</u>	<u>War Parties</u>	<u>Captures</u>
1640	X X X X	Kichesipirini, Petite Nation, St. Lawrence Algonkin plan to fight	
1641			
1642		Iroquet Algonkin Algonkin	
1643		Algonkin 2 parties Algonkin to Iroquois hunting area Miscou Montagnais and Algon- kin	
1644		Gaspé Huron and Algonkin (Richillieu River)	3
1645		Algonkin raid Iroquois on St. Lawrence Acadie group raid Bersiamites	14
1646	X X X		
1647		St. Lawrence group Petite Nation (on river) Tadoussac, Sillery Indians and French	1
1648		Algonkin, to Three Rivers	

because of Iroquois activities (27: 37). The Jesuits reported that the Algonkin and Montagnais had decreased in numbers so much that the Iroquois had no fear of them (24: 273).

By the winter of 1643-44 depopulation was great. Some of this reduction might have resulted from Indian avoidance of these areas because of the enemy; in this year the Indians of Sillery went away in fear (25: 192) and Indians from there and from Tadoussac went hunting three months early to avoid the Iroquois. The women and children may have been dependents left near the French. However, great depopulation had occurred, and strength to combat the enemy successfully had diminished; an Algonkin complained that they were now like women - they could "only flee" (25: 157).

Vimont reported:

Disease, war and famine are the three scourges...No sooner had disease ceased its ravages, than war - which had previously been so much to their advantage that they had become Masters of their enemies' country, and had defeated them everywhere - commenced, and has since continued to be so disastrous to these that they have lost all their best warriors, have been driven from their country, and at present do nothing but flee from the cruelty of the Iroquois (25: 105-107).

The St. Lawrence-Ottawa River groups went to war, but lacked success, if French reports are to be believed and have not been edited in order to encourage mission support (as discussed in the Huron section). Some sorties followed epidemics, and may have been responses. The revenge motive would probably have dominated more and more as Iroquois inroads increased.

Change in the French View of Warfare

Until the late 1640's, Jesuit views of Indian warfare, and thus of Indian intentions, stressed death and destruction. Warfare was "but wars of extermination (27: 27). They wanted "to ruin, exterminate, kill them, and frighten them from coming to war by cruel torture" (19: 81).

Iroquois war parties in early 1641 were described as going "to meet the Hurons and the Algonquins, with the design of pillaging, killing and massacring all those whom they could surprise" (21: 33). For example, "Five Huron canoes were attacked by these robbers, who massacred some of them; others escaped, and others fell alive into their hands, to be the sport of the flames and of their rage, and to be the food of their wretched stomachs" (21: 65). The seminarists captured with Bressany and others in 1644 were said "to serve as a prey for the flames, and for their stomachs hungering after the flesh and blood of all these peoples who hear us" (26: 19). (This prediction is especially ironic, as the attacking party consisted of 6 Huron and 3 Mahegans, as well as Iroquois - 26: 35, 315).

In the winter of 1641-42 Lalemont assumed (or at least implied) that women and children were burned in the Huron village attack: a "band of barbarous Iroquois having surprised one of our frontier villages, spared neither sex, not even of the children, and destroyed all by fire, except a score of persons" who escaped (26: 175). In 1642 the Kichesipirini were said to have "ascended far into the country of the Algonquin,

whither the Hiroquois followed and massacred them" (22: 249), that those not immediately killed would "become the objects of their sport, and food for the flames and for their stomachs" (22: 249); a Kichespirini at the St. Lawrence was told that his group "had been taken, - killed, massacred, burned, roasted and boiled by the Hiroquois" (22: 129).

The Jesuits reported that warfare was so intense in Huronia that even women and babies were not safe, perhaps not realizing that these were often the targets. Their complaints that never more than two of the enemy were captured at a time - because they had preceded the main party - may represent an ignorance of individual and small-scale raids around enemy fields.

In his 1643 summary Lalemont states that war had "carried off" a great number of people (26: 175). The French and/or translator use this term for both death and capture. (During the epidemics people were said to have been carried off). His meaning here is not clear. His belief that raids resulted in death, not capture (or capture followed by death in flames) suggests he means killed. However, he also reports hundreds of captures.

In 1642 results of raids on Huronia were said to be massacres, not captures (26: 179), and in 1643 the country was described as "one scene of Massacre" (26: 175). Lalemont reported in 1645 that the Iroquois came to Huron areas to "slay those who supported [the Faith] to ravage their villages, bringing with it general desolation, and wasting everything with fire and sword" (28: 43). Even the description of the capture

of the village of St. Ignace in 1649 - which resulted in Huron dispersal - stated that those not killed were being reserved for torture later (34: 125).

Likewise, Huron intentions towards their enemies were described in 1640 and 1646 as being to kill or to capture to kill later (19: 81).

Jogues, from his vantage point in eastern Iroquois villages, reported that the Iroquois fought for captives (39: 177; 24: 295-297) and desired to kill some and integrate the rest of the Huron. Because of his sources, Jogues' reports of Iroquois intentions were presumably more accurate.

The Jesuits did note captures and particular captives whose lives were spared, although their summaries focussed on death and destruction.

Later in the 1640's they recognized the fact that many in destroyed Huron villages and a Tionnataté village, as well as dispersing Hurons, were captured. In 1651 Rageneau reported:

- a) that the Iroquois had attacked the Neutral and taken an "exceedingly large" number of captives, especially "young women, whom they reserve, in order to keep up the population of their own villages" (36: 177);
- b) that following an Iroquois attack on Algonkin on Lake Nipissing, "the poor women and children were, as usual, dragged away into captivity" (36: 189); and
- c) that the Iroquois killed only the captain of a Huron band, letting the others remain alive, and thus "swelling their troops" (38: 51).

As integration of women and children and some adult males had been happening all along, it is quite clear that Jesuit realization, or reporting, of this practice, rather than the practice itself, occurred belatedly.

Changes in Treatment of Captives

Most of the data on treatment of captives is about Mohawk behavior, as descriptions of formerly-captive Indians and Frenchmen were included in the Relations. There is evidence that the Mohawk kept more alive than previously.

That fewer captured women were sacrificed by eastern Iroquois than previously is suggested by Jogues' description of the offering of the first fruits of the hunt in 1642. The spirit was told that the Indians knew they were capturing fewer of the enemy because they had failed to kill the first captured in the previous year, and in 1643 they ceremonially killed three of the first women captured (39: 219-221).

Male Algonkin, the five males among the 22 of an unnamed group captured in 1643, and some Huron males were killed, but many Huron males were kept alive. Of the 22 Huron captured with Jogues in 1642, 19 were spared (24: 281); moreover, the captain of the capturing party was a Huron who was taken when an adult (24: 305). Three Huron captured in 1642 were spared (26: 195), and in 1643, two of four were let live (25: 45). In 1646 four were spared (32: 27).

Naturalized Huron were mentioned throughout the 1640's. Bressany's 30 captors included six former Huron and three former Mahegan (26: 37).

Two descriptions hint at procedures used to save adult enemy male lives. Bressany reported that they gave him "with the ceremonies of the country, to an Old woman, in place of her Grandsire, killed some time before by the Hurons. She, instead of having me burned, - as all desired, and had already resolved, - ransomed me from their hands at the price of some beads, which the French call 'porcelain'" (39: 75-77).

A Huron captured with Jogues later reported "after having been given to people who had not sufficient means to save my life, by giving presents according to our customs, - [God] caused that they did not accept me and that I was, for the second time, given to another, who had the means and the wish to deliver me from death" (24: 285). Thus captives were distributed to the bereaved, but could be saved from torture and death by sufficient payment.

Although adult male captives would be expected to try to escape, not all did. In 1647, one said "'I love my mother too well: she has saved my life, and I cannot leave her'. This was a Hiroquois woman to whom they had given him, in place of her children and relatives killed in war" (32: 27). If her children had died in the epidemic just ending, and not in warfare, it is possible that captives were replacing relatives who had died of disease.

Adult Algonkin males were apparently always burned. One Algonkin warrior was not killed, but he was young and had been captured two years before when he may have been regarded as a child.

It is not known if the western Iroquois spared male Huron captives, except for negotiation purposes. The Onondaga had 100 Huron captives in 1647, but their sex is unknown. The Mohawks may have spared Huron males because they were not traditional enemies and because they wanted to increase numbers and strength.

Adult males worked at subsistence activities and as warriors. They worked in fields (24: 279), helped on trading expeditions to Dutch posts (24: 285; 39: 223; 25: 45), fishing expeditions (39: 215; 25: 45) and hunting expeditions (39: 231). They carried corn to the hunters (39: 229) and meat back to the villages (39: 211, 227). They tended the ill (39: 229).

Huron captives participated in Iroquois war parties in 1642 (24: 305), 1643 (24: 279, 285, 287, 305), 1644 (26: 55), 1647 (30: 289), 1648 (32: 157), and 1649 (24: 141). They guided Iroquois parties in Huron and Algonkin areas (24: 305; 30: 289; 33: 91) and acted as go-betweens in negotiations (21: 51, 24: 29).

The French frequently referred to captives as slaves (22: 267; 39: 219), e.g., at Jogues' capture, the Iroquois are reported as having hurt the French but having left "unharméd the Hurons, who were now made slaves" (39: 183). During the journey to Iroquois villages the captives carried loads and water, collected firewood, and cooked (39: 61; 24: 279).

Intention to capture

There is some evidence that large captures were intended, and not just accomplished by chance. The eastern Iroquois captors of the Kichesipirini in 1642 may just have been a hunting party: Mohawk males might have been expected to be away in greater numbers and for longer periods following the crop failure and subsistence interruptions caused by the epidemic of that year. However, the Iroquois usually did not penetrate that far into Algonkin territory. Champlain was told in 1612 that the difficulty of passage, especially because of the numerous rapids, protected the Kichesipirini from enemy attack. However, this party came in winter, when escape from attackers was more difficult because of lack of foliage in the forest and tracks left in the snow (10: 51). That the party was large enough to manage the captives may indicate that the large capture was the Iroquois intention, and not accidental. The process was repeated in 1647, and the 100 captured near the St. Lawrence that year would likewise have required a sizeable attacking party.

The western Iroquois destruction of the Huron village in 1642 and the capture of its inhabitants would have required sufficient numbers not only to manage the captives but also to defend the retreat from Huronia. Similarly, the Neutral, Huron, Algonkin and Montagnais parties would have needed a considerable number to accomplish their large captures.

Two propositions require substantiation if the hypothesis is to be supported: that large-scale captures and adoptions

followed epidemics in the northeast, and that they resulted from a conscious desire to increase population.

The data is uneven, but based on what was reported, some large civilian captures followed epidemics. There is no statement of intention, but the evidence includes:

- large captures and in some cases many small ones are reported following known epidemics among the Neutral (1640-42), the western Iroquois (1642-43), the eastern Iroquois (1647-49) and the Huron and Algonkin (1638). Warfare with intent to capture may have been waged by the Montagnais, Algonkin and Huron. If Iroquois epidemics spread among Iroquois nations, captures by eastern Iroquois in 1642-44 and by western Iroquois in 1647-49 also followed epidemics;
- the stated concern over loss of numbers;
- the traditional use of captures and adoptions to increase or restore family, and thus group, size;
- Indian and French perceptions of Iroquois intentions;
- the keeping alive of more captives than usual, especially males;
- the failure to sacrifice first captives annually;
- the practice elsewhere, and in one case the stated intention, to increase numbers with enemy captives following epidemic depopulation.

In addition, it is suspected that mission Indians captured and adopted enemy individuals, but that this was unreported by the Jesuits for political reasons.

CHAPTER 5

A CONSIDERATION OF OTHER CAUSES OF WARFARE

Economics

Post-epidemic captures could have resulted from warfare which increased for other reasons. For example, the economic motivation would seem to be supported by the acquisition of goods with captives, e.g., in the 1647 captures of Algonkin.

Trigger (1976) suggests that the volume of furs traded by the Huron in the mid-1640s attests to trade dependence. The fur production totalled: 1645, 30,000 lbs.; 1646, 32,000 lbs.; and 1648, 22,000 lbs. This was greater than production in the 1630s although, Trigger believes, the Huron population had declined by half. However, the production could have been of this size because: 1) disease in the 1630's would have kept volume of trading low; 2) only by the mid-1640's did disease incidence ease off in Huronia, and perhaps in the hunting groups with whom the Huron traded; 3) because French soldiers escorted the fleet in 1645; and 4) because Iroquois raiding of trading parties decreased in 1645-46 because of peace negotiations.

The supply in 1648 represents two years of production, as the Huron didn't go to the St. Lawrence in 1647. The comparatively low rate may reflect Huron preoccupation with defending Huronia in 1647.

Trade has been cited as the reason for the Iroquois peace negotiations of 1641 and 1645. However, depopulation and blood-feud considerations have been demonstrated as having high priority, and there is evidence that the Iroquois purpose at

these talks was to remove French protection of Iroquois enemies.

Other Epidemic Effects

The trade continued, but is new motivation necessary to explain the increased warfare? It has been shown that desire for captives represents a reasonable motivation for at least some of the warfare. Other epidemic effects could have resulted in increased attacks as well.

1) In the blood feud, avenging war deaths is part of the mourning process. In an emotional climate where the response to loss is attack, where replacement of the deceased completes the mourning process (even if the replacement is symbolic), unprecedented volume of deaths might have stimulated warfare by triggering a conditioned response, evoking a desire for revenge to "allay the grief", as the headman from Acadie said.

2) Showing prowess as warriors by successfully - in blood-feud terms - combatting the enemy may have represented attempts to wield or demonstrate power, following powerlessness during epidemics. The Huron, at least, had lost confidence and feared their powers were being undermined by forces beyond their control.⁶ An added factor in the northeast was the need for the recipient of the name of a warrior to prove his worthiness in war (10: 277).

⁶Compensating for failure in one pursuit by succeeding in another was demonstrated by Australian aboriginal males who, when failing in their role as providers, focussed on another acceptable role - that of aggressors, captures of women - despite the fact that this proved counterproductive to group survival (Cawte 1978).

3) The relatively strong would press advantage over weaker enemy groups (a prospect apparently feared by the Huron and Algonkin following their epidemics). In this sense the Iroquois intention reported by Jogues - to kill the most important Huron and some others and to join the rest to the Iroquois - is perhaps the ultimate blood-feud aim, but possible only in unusual circumstances.

4) Weaker groups may have attacked to demonstrate strength, in order to deter enemy attacks when feeling vulnerable.

The last two motivations have been reported in blood-feud warfare elsewhere (Vayda 1976).

Once warfare increased, the avenging of war deaths would have increased.

These motivations, if present, combined with the desire for additional population, might explain the outburst of raiding following epidemics.

Famine

Famine - the third in the reported triumverate of Indian misfortunes - may also have affected warfare. Disease, war and famine are repeatedly cited as affecting these groups. Among the Algonkin and the Montagnais, famine accompanied disease. In 1635 the French saw starving, "fleshless" and "disfigured" Indians, and heard reports of cannibalism (8: 31). Later, famine resulted from warfare after the epidemics when, because of depopulation (the French assumed), they were vulnerable to Iroquois attacks and unable to use their hunting areas because of Iroquois presence (24: 271; 25: 105-107). A Kichesipirini

account corroborates the French reports: "Now we are reduced to nothing; disease has exterminated us; war had decimated us; famine pursues us, wherever we go" (26: 303).

Among the Neutral, war, famine and disease were reported as having been "unusually prevalent" for three years up to 1641 (21: 191). They had famine in 1643-44 and 1648-49 as well.

In Huronia, it was reported in 1642 that "the terror and dread of War have followed the fatal diseases which in previous years caused mourning and desolation everywhere" (22: 305). However, a summary of the mission in 1645 said: "Maladies succeeded one another... then Famines had their turn: ... Wars have been more pitiless" (28: 41-43).

In Huronia productivity decreased because of illness during epidemics and probably because of recuperation periods and endemic incidence of disease after epidemics, and scarcities were increased by the immigration of Wenroronon and other refugees. Then horticultural production was impeded by the intense Iroquois raiding beginning in 1641, which also hampered collection of wild foods during famines. Famine occurred to various degrees periodically throughout the 1640s - in 1641-42, 1642-43, 1643-44, and 1648-49.

For the Iroquois, we know only that Mohawk crops failed the same summer that the 1646-47 epidemic began. Some droughts reported for the Huron area may have affected the Iroquois as well, especially the nearest groups (the 1643 drought was said to extend for 100 leagues). Decreased production due to epidemics and their effects probably resembled that of the

Huron. The degree of disruption of their subsistence activities by enemy raiding around their fields is unknown.

That the effects of famine may have affected warfare is suggested by the conjunction of events reported for the Neutral: following three years of famine, disease and war, the males were away all winter. Male absence may have increased with food scarcity in horticultural groups.

Huron subsistence and male presence - An estimated 65% of Huron food was corn, 15% was beans and squash, 9% was fish, and 5% meat (Heidenreich 1971). Horticulture permitted the Huron to store surpluses, rendering their subsistence less precarious than that of the Algonkin (Trigger 1976). They tried to sow enough each year for several years supply (Biggar 1922-36) and used some of the surplus to trade, e.g., to the Algonkin for fish. When local supplies dwindled, they traded for corn with horticultural neighbors - other Huron, Tionnataté or Neutral (Trigger 1969). During famine, those at home dispersed in small groups, collecting wild foods such as acorns and roots.

Although great flexibility in food sources undoubtedly obtained, and starvation could be avoided through alternate strategies, crop failure required temporary alterations in seasonal locality and behavior. Women remained near villages, to ensure future harvests. Probably remnants of stored food would have been left to them, as males could support themselves - hunting, fishing and gathering - on their seasonal expeditions, as they often did anyway.

Male seasonal dispersal was characterized as trading, hunting, war and fishing expeditions by the Jesuits. Descriptions of these trips reveal that the men very often lived off the land.

Corn supplies were reportedly carried and/or cached during expeditions (Biggar 1922-36 Vol. 3) but they may have been reserved for periods when hunting would have been dangerous because of enemy proximity, as in 1613 when corn was eaten only when Champlain's party approached the Iroquois (Biggar 1922-36, vol. 2).

The caches positioned along the trading route to the St. Lawrence may have been necessary because of enemy presence there: in 1642 and 1644 Huron trading groups were attacked, while hunting, by the Iroquois along the Ottawa and St. Lawrence rivers (22: 273; 26: 31)

Thus corn may have been supplemental to living off the land during male seasonal dispersal. It is possible that the Huron economy did not support male travel as much as it necessitated it (D. Keenlyside, personal communication, March 1979), especially during periods of food shortages. At those times, and until the next harvest, dependence on wild food resources would have been great, and the duration of male seasonal dispersal may have increased.

If famine necessitated male absence, it may have increased occasions for their attacks on enemy villages and subsistence groups. Likewise, successful raids on their own undefended villages and food-collecting females may have increased. If attacks impeded horticultural activities, this would have

affected subsequent harvests and future food supplies. On the other hand, bountiful harvests producing enough stored food to last two or three years would have permitted more continual male presence and thus better defense, fewer enemy successes, and better harvests.

An Iroquois comment in 1649 suggests that warfare was sometimes incidental to hunting - that some warfare occurred because males were abroad, not because it was their main objective. After hunting near the St. Lawrence, his group "had resolved before returning to their country, to come and break the heads of some Algonquins, if they should meet any" (32: 51).

The Huron data are too incomplete for a conclusive analysis, but there is some correlation between food scarcity and male absence, as well as food abundance and male presence. War parties are described for early spring in only two years, 1639 and 1642; food had been scarce those winters (17: 119; 35: 127, 147). During 1644 - a famine year - two war parties are reported to have been away for over two months (28: 89, 93), and Iroquois raids on Huronia were most intensive.

There was a good harvest in 1645. An Iroquois attack on Teanaostaiaé was deterred in 1645-46 by the presence and preparedness of male defenders. In the summer of 1647 Teanaostaiaé was threatened again, but the Huron had stayed home, to defend the country, and this may have deterred the attack. However, the town was undefended in 1648, when attacked, the men being away hunting, at war, or for other reasons (34: 87, 39: 239). Perhaps they were away because stored supplies

were sparse because of greater than usual male presence during the previous two years. In 1649 there was famine throughout Huronia - the worst in 50 years (34: 197). The men of St. Ignace were away, at war or hunting, when it was attacked in March (39: 247).

Iroquois winter presence in northern areas is reported for almost every year during the 1640's; it is possible that food scarcity led to increased male absence from Iroquois villages and their presence in northern hunting areas. In addition to the factors causing shortages in Huronia, the influx of many captives may have strained food supplies, initially at least.

The eastern Iroquois were wintering around the St. Lawrence and Ottawa rivers from 1640 on. That the eastern Iroquois who hunted extensively in northern areas during the 1645-46 truce killed a reported 2000 deer suggests subsistence reasons for their presence in winter.

The poor harvest among the Mohawk and an epidemic in 1646 was followed by intensive raiding and large winter captures. The extended hunting parties by the Seneca in 1647, 1648 and 1649 may be partly explained by food scarcities at home because of large captures.

In 1648, the Onondaga peace embassy took a long time to reach Huronia because they hunted game "on which they subsist while on the road" (33: 123).

In sum, it is possible that famine, resulting from a decrease in production during epidemics and because of enemy

raids after the epidemics may have altered male seasonal behavior, resulting in villages and fields being undefended for longer periods and increased opportunities for successful attacks by male parties living off the land. Thus the horticultural groups' response to famine may have contributed to the increase in warfare and in its damaging effects in the post-epidemic period in the northeast.

Scarcity of goods - Another result of decreased production during periods of epidemics and increased warfare was the scarcity of material goods. During the first epidemic, two Huron were described as "stripped, or almost so, of all their goods because several of their friends were dead" (8: 121). After three years of famine, disease and, war a Neutral woman was awaiting the return of the hunters for some garments (21: 233).

Shortages would have been increased by the vast amounts of grave goods required for the epidemic dead. These traditionally included furs, axes, wampum, combs, gourds of oil and loaves of corn bread. Axes, robes and wampum were considered important in the village of the dead (Wrong 1939). Although feasts and grave goods apparently decreased in quantities in the epidemic period, they would have represented a vast drain on material resources, at least at first.

Shortages of food and material goods, and responses to these shortages, are epidemic effects deserving of further study, as the understanding of them will contribute to interpretation of behavior and events.

The precise interaction of epidemics, famine and warfare, and their effect on behavior are difficult to establish especially on the basis of limited data; however, the possibility exists that epidemics set in motion other depopulating mechanisms and that disease deaths represent only a portion of the eventual depopulation caused by epidemics (cf. Krech 1978).

Conclusion

The institution of the blood feud has been shown to be persistent by nature, and this has been recognized for the northeast (Fenton 1971; Trigger 1976). Despite temporary lulls in blood-feud warfare, e.g., following negotiated truces (the Seneca-Huron peace) or epidemics (for the Snake and Piegans), the needs to avenge war deaths, prove manliness, and achieve status continue and so, eventually, does the warfare.

Close inspection of the facts, informed by the blood feud literature, reveals that no new motivation was necessary for the increase in warfare. It could have resulted from an increase in the usual motivations and/or from changed circumstances in the warring groups - both resulting from the epidemics.

<u>Usual Motivations</u>	-	<u>Leading to Increased Warfare</u>
Revenge	-	For disease deaths, and later for increased war deaths.
Display virtues of a warrior	-	To compete for status and leadership, following leaders' deaths.
Regain or demonstrate power	-	Following the perceived loss of it during epidemics.
Acquire captives	-	To enlarge depopulated families.

Increased warfare, even on such a scale as that in the northeast in the 1640's, could result from the cumulation of individual acts, motivated by epidemic effects.

Changed circumstances, such as variation in depopulation or in timing of epidemics between enemy groups, and traditional motivations could have increased warfare. Stronger groups might press the advantage, and weaker ones attack to deter enemy attacks. Through time, variation in group strength might increase, leading eventually to dispersal of the weak.

Scarcity of food was another changed circumstance: it required alterations in living patterns which affected defence and perhaps war behavior. Demoralization, although difficult to ascertain and the effects of which would be impossible to trace with the available data, may have affected behavior.

The increased destructiveness of warfare has been attributed to a new motivation - necessity for trade goods - the evidence for which has been in some cases, increased warfare. The economic explanation hinges on the fact that the results of warfare changed, and that therefore the motivation had changed.

However, different results don't require different motives. Settlement destruction and group dispersals happened earlier in the northeast and elsewhere in blood-feud warfare.

Hunt was correct in seeking the cause for warfare in "a general condition of Indian life"; he erred in ignoring the epidemic disease experience, which coincided with the spread of European trade but which more profoundly affected Indian groups.

Epidemic effects, as detailed above, increased usual blood-feud motivations and variously altered strengths of enemy groups, and thus could have resulted in the events which occurred in the 1640s in the northeast.

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