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HUNTERS AND GATHERERS IN THE INDUSTRIALISED WORLD

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ALBERTO BUELA
**Hunter-Gatherer Transformations and Mixed Economies:
A Case Study from Alaska**

ABSTRACT This paper presents a materialist research strategy for the study of historical processes of change among hunter-gatherers, as they become incorporated into industrial society. Two aspects are discussed: 1) a theoretical model of sociocultural systems for categorising phenomena, and 2) a theoretical principle for identifying causal relationships. The approach is illustrated with a case study on the transformations of an Alaskan Inupiat community, touching on several aspects of sociocultural life, including population, subsistence, technology, social organisation, economy, and politics. The focus lies on the changing role of the hunting economy and its related institutions.

KEYWORDS hunter-gatherers, mixed economies, materialism, Alaska, Inupiat

I. Introduction

In most parts of the world, hunter-gatherers have been experiencing profound transformations due to their incorporation into expanding industrial nation-states. In the Arctic context, in particular in North America and Greenland, a substantial body of research has arisen focussing on the emergence of mixed economies, in which communities integrate subsistence hunting, fishing, and gathering with market economies. These transformations encompass changes in almost all spheres of sociocultural life, including population, subsistence, technology, social organisation, politics, and economy.

The main purpose of this paper is to propose a materialist research strategy for the study of these transformations, and the diverse phenomena they involve. A theoretical framework will be presented in order to cate-

gorise phenomena and understand how the components of a sociocultural system fit together. Furthermore, a materialist theoretical principle for identifying causal relationships between phenomena will be discussed. The approach should serve the application of a materialist strategy to the study of historical processes of change. These may include processes of contact and interaction between indigenous societies and Western society, processes of colonisation, as well as the incorporation of small-scale societies by larger ones.

A case study of Inupiat¹ hunters from Alaska will be used to illustrate how this research strategy can be applied. For this purpose, findings from the available ethnographic and ethnohistoric literature will be combined with first-hand observations and data collected through ethnographic fieldwork. However, the main objective here is neither an exhaustive literature review nor an extensive empirical study. Rather, my aim is to contribute to the study of mixed economies and the transformations of hunter-gatherers in general by (re)organising data and findings into a materialist theoretical framework, in order to establish causal relationships between phenomena and suggest further issues for research, when appropriate.

2. Approach

Every paradigm operates with a series of epistemological, ontological, methodological, and theoretical principles that guide research and the generation of theories. They constitute basic assumptions about the production of knowledge, the nature of the object of study, the procedures to approach its investigation, and the causal relationships that explain phenomena. It is with the latter, the theoretical or causal principle, that I am concerned here. My objective is to propose and illustrate the application of a materialist research strategy to the study of the social and cultural transformation of hunter-gatherers and the emergence of so-called mixed economies, through Ferguson's (1995) revised principle of the priority of the infrastructure.

The basic assumption of a materialist approach is that social and cultural life must adjust to its material conditions and the practical aspects of life. Thus, the general proposition is that the causes that explain social

and cultural phenomena must be sought in their material basis, however this is defined. The latter is usually conceived as those components of the sociocultural system that interact with the system's natural environment. This assumption is found for example in Marxist historical materialism, theories of sociocultural evolution, and ecological approaches to culture. Various models of sociocultural systems have been formulated in order to categorise phenomena and define in a more precise way how causality operates within the system. In his exposition of cultural materialism, Harris (1979, 1994) synthesised some of these insights and developed a theoretical model of sociocultural systems as consisting of three layers – infrastructure, structure, and superstructure – into which phenomena can be analytically classified:

Infrastructure is the interface with which society interacts with the natural environment, and encompasses the material relations that support social and cultural life. It consists of the modes of production and reproduction. The mode of production is the way a system harnesses the necessary energy from the environment, including the technology of subsistence and labour patterns. The mode of reproduction is the way a system reproduces itself, and consists of demographic variables and the techniques for reproduction.

Structure comprises the social relations that organise (socially, economically, politically) the individual constituents of a sociocultural system in order to carry out the activities for production and reproduction. Its horizontal dimension is the domestic economy, including social organisation, family and household structure, kinship, gender and age roles, as well as forms of exchange and distribution of resources. The vertical dimension is the political economy, which includes political organisation, hierarchies, and patterns of leadership and decision making.

Superstructure consists of the symbolic and ideological aspects of sociocultural systems that give meaningful content to structural relations and guide people's action and thought. Superstructure can be divided into *etic*/behavioural phenomena, such as rituals, art, sports, games, and hobbies; and *emic*/mental phenomena, including cognitive dispositions, norms, values, beliefs, religion, philosophies, and science.

With the above-explained model of a sociocultural system and its main components, Harris (1979, 1994) elaborated a causal principle that

gave highest priority to the infrastructure, so that the infrastructure probabilistically determines the structure, which in turn probabilistically determines the superstructure. Therefore, changes in the infrastructure will effect changes in the rest of the system, and similar infrastructural conditions will produce similar outcomes in the structural and superstructural dimensions. In this model, virtually any sociocultural phenomenon could be traced back to the infrastructure. In this way, the model of sociocultural systems serves to order phenomena analytically, while the theoretical principle indicates the way causality operates within the system and therefore where the causes for each sociocultural phenomena should be sought.

This model and theoretical principle synthesised in Harris' cultural materialism has been applied more often in functional-ecological analysis or to the study of long-term evolutionary change. Therefore, it has been criticised for not being suited for studying historical processes. Furthermore, the possibility of tracking every sociocultural phenomenon to the infrastructure has been questioned, meaning that in some cases there might be only structural or superstructural factors that explain certain phenomena. In order to overcome these shortcomings, Ferguson (1995) proposes a revision of Harris' causal principle of the priority of the infrastructure. For this purpose, he distinguishes between historical and evolutionary time scales. While infrastructural variables are more likely to account for macro-evolutionary changes, the study of short-term historical processes usually requires considering other variables to explain phenomena. For example, as one component of the structure changes, other elements in the system will be affected as they rearrange. Thus, causal factors for the latter must be sought in the structure and not in the infrastructure. Furthermore, processes of historical change often involve several and complex factors that appear simultaneously at different levels of the sociocultural system, making it impossible to track every change back to the infrastructure.

Ferguson (1995: 25) defines the relationship between infrastructure, structure, and superstructure as a "nested hierarchy of progressively more limiting constraints." This implies that "the infrastructure is the primary, general determinant of sociocultural form, but that other causal relationships must be sought to explain many sociocultural patterns" (Ferguson 1995: 22). Thus, each of the three levels of a sociocultural system has a

certain degree of causal autonomy, but within a limited range of possibilities determined by its underlying level. In this way,

rather than requiring that *every* effort to explain *any* cultural phenomenon begin with the infrastructure, [Ferguson proposes] that we seek from the start to identify causal regularities throughout the sociocultural system. Thus, answers to certain kinds of questions would *regularly* be sought in structural or superstructural conditions. (Ferguson 1995: 24)

Ferguson has applied this principle to the study of Yanomami warfare and its relations to Western contact (Ferguson 1992), and to develop a paradigm for the study of war in general (Ferguson 1999). The advantage of a materialist research strategy is that it places sociocultural systems within broader ecological systems and considers their interactions, and that it provides a mechanism to explain social and cultural forms and processes of change by establishing clear causal relationships that can be verified and falsified. With the case study presented below, my objective is to illustrate how this research strategy can be applied to changing hunter-gatherers as they become incorporated into expanding industrial states, in particular with the emergence of so-called mixed economies. Through the analysis it should become apparent how different components of the sociocultural system relate to each other, and that causal relations must be sought within each systemic level in addition to in the infrastructure.

3. Case study: Inupiaq hunters of Bering Strait

The case study presented here is concerned with the transformations within an Inupiaq community in Alaska, with particular attention to the changes to the communal hunting of large sea mammals and their related sociocultural features. The analysis will be restricted to the infrastructural and structural levels. The only reason for this is that superstructural aspects were not primarily the focus of my research. This, however, is not detrimental to the illustration and application of the approach. When discussing the structural level, I will demonstrate that there are structural factors – both internal (within the sociocultural system) and external

(from the social environment) – that have to be considered in addition to infrastructural ones. I will return to this argument in the conclusion. The case study is based on an ongoing research for a Master's thesis, with data collected through ethnographic fieldwork conducted in the village of Wales during the springs of 2015 and 2016.² First hand observations and data collection were supplemented by historical and ethnographic sources.

3.1 Ethnographic background

The village of Wales is located slightly below the Arctic Circle on the Cape Prince of Wales, facing the Bering Strait at the westernmost point of the Seward Peninsula in Northwest Alaska. Wales (Inupiaq: Kinjigin) was the main village for the Kinjikiut people, with one of the highest and densest populations in Northwest Alaska at the time of contact. First contact with Europeans in the Bering Strait region occurred in the late eighteenth century with the arrival of expeditions and explorers, but this did not affect Inupiaq societies much. Involvement with Western society became more intensive during the second half of the nineteenth century, with the expansion of commercial whaling and trade in coastal Northwest Alaska. In the last decade of the 1800s, Americans began to settle in the region, schools and missions were established, and a process of deep transformation began as Alaska Natives became integrated into U.S. society throughout the 20th century. Currently, the community of Wales has a population of around 150 people, and a mixed economy based on subsistence hunting, fishing and gathering, combined with wage employment and transfer payments. The village is only accessible by small plane, boat, or snowmobile. It possesses modern housing and facilities such as a school, a clinic, two stores, and a power station.

3.2 Ecology

Wales lies within Arctic Alaska, as defined by the mean 10°C isotherm in July as well as the tree line, characterised by treeless tundra and a climate with long cold winters and short cool summers. Sea waters start to freeze up around October, while break-up starts around April. Being at a high latitude, the Arctic environment is characterised by a high seasonal variation due to the uneven distribution of solar radiation throughout the year, which results in food resources being available only during certain periods

of the year, and usually in bulk. In comparison to other Arctic regions, coastal Northwest Alaska exhibits a larger abundance of animal resources accessible to humans.

The low abundance of terrestrial mammals and the lack of large streams containing large stocks of fish have contributed to the primarily maritime orientation of the Kinjikiut people. Furthermore, the village is situated on an advantageous point from which to access great amounts of large sea mammals (whales, walrus, seals), since the Bering Strait acts as a bottleneck for their migratory routes during spring and fall. These animals have constituted the main subsistence base for the people of Wales, supplemented by fishing (at the ocean shore or in nearby streams), hunting of terrestrial fauna and migratory birds, and gathering of berries, tundra plants, eggs, and some shellfish washed up on the beach.

Sociocultural systems must adapt both to their natural and social environment. Ecological variables and their interaction with the infrastructure account to a large extent for the evolved sociocultural adaptations. The historical process considered in this paper is characterised by rapid and drastic changes in the social environment of Inupiaq society. Thus, the following analysis will be primarily concerned with the latter factors and their relations to contemporary social and cultural transformations.

3.3 Infrastructure

Large sea mammal hunting requires extensive cooperation and is carried out by specialised task groups in the form of boat or hunting crews. These groups involve several people, including those actually going out hunting and other people who work to support the hunting effort. The traditional division of labour was between the sexes: men do the hunting and make tools while women are in charge of processing raw materials, including food, and hides for clothing and boat construction. Cooperation between several individuals is needed due to the labour and transportation requirements posed by large animals such as bearded seal, walrus, and whales; that is, for retrieving, towing, and butchering the animals. This is more pronounced in the case of bowhead whales, which, due to their huge size, require an almost village-wide cooperation. Furthermore, since sea mammals are available for only a short period of time, a community must be able to mobilise several crews for resource monitoring over a large area,

in order to successfully subsist on these large marine mammals (Ellanna 1988a: 82). While small seals usually do not constitute the main focus of a boat crew, they are hunted opportunistically, and may even constitute the only prey if larger game is not encountered.

The open skin boat or *umiak* was a central technological innovation in the ecological adaptation of coastal communities subsisting on large sea mammals. It consisted of a driftwood frame covered with several walrus hides (seals were used in other regions), and required intensive work for its construction and maintenance, much of which was done by women. With a great capacity for carrying freight, skin boats were used for hunting, trading, and moving whole families to summer campsites. Thus, they were essential for most subsistence activities in addition to maritime hunting. Open skin boats and harpoons provided the technological means for accessing large marine fauna, which supported larger populations – typically several hundreds – than other hunter-gatherers in the Arctic and elsewhere. At the same time, the feasibility of this technology depended on a minimum overall population as well as on a certain amount of adults in productive age cohorts (Ellanna 1988a, 1988b).

Burch (1975) identifies three major population trends among the Inupiat of Northwest Alaska caused by contact. First, there was a general inland-coastal migration through the establishment of whaling and trading centres. This trend was partly reversed after the collapse of commercial whaling during the first decades of the 20th century. Second, strong population declines occurred due to the introduction of disease and liquor, and to the depletion of resources, in particular whales and walrus. Later, from the 1940s on, death rates were reduced and longevity increased due to medical care, which led some populations to remain stable or even grow. Third, there was a general trend towards sedentarisation and the concentration of the population in permanent villages. Dispersal of population also took place with the introduction of reindeer herding and commercial fur trapping, but this trend was reversed by the 1940s when both activities declined. It must be noted that great declines in caribou due to ecological factors also contributed to the inland-coastal movements and the initial population declines. In a recent study, Hamilton and Mitiguy (2009) show that contemporary Arctic Alaskan communities (the sample consists of 43 towns and villages, including Wales) have a high potential for natural

increase, and that net migration is the main factor for variation in population change across time and space. According to the study, most communities experience net outmigration, which in some places offsets natural increase.

Demographic changes can affect subsistence patterns. In Wales, diseases at the end of the 1800s, and especially the influenza epidemics of 1918 and 1919, decimated the population, from estimates ranging between 500 and 750 (Burch 1975: 12; Oswalt 1967: 6; Ray 1992: 110f.) to about 130 inhabitants (Ellanna 1983). Since that time, it has not recovered to more than a third of its historical numbers. This catastrophe claimed the lives of many productive people, including elders and experienced hunters, challenging not only the immediate subsistence needs of the population but also the transmission of skills and knowledge over the generations. Furthermore, Ellanna (1988a: 83f.) points out that reduced populations in Bering Strait communities severely undermined the labour requirements for whaling, resulting in an increased reliance on and specialisation in walrus and seal hunting, and an inconsistent pursuit of whaling throughout the 20th century.

Another consequence of contact was the introduction of new technologies, with important impacts on subsistence, mobility, and work patterns. Firearms in the late nineteenth century and outboard motors in the 1920s changed hunting techniques, allowing hunters to travel faster and farther, and to kill animals at greater distance, thus making the hunt more efficient. However, the major significance of this technological change lies in the fact that these technologies became an essential means of production for subsistence. The result is that the sociocultural system becomes dependent on external and commercially distributed material and energetic inputs from an industrial economy, what Pelto (1987) has termed the “de-localization of energy sources”.

A second important technological change in Bering Strait communities was the adoption of aluminium boats from the 1970s, which gradually replaced skin boats until their complete abandonment in recent years. This had effects on mobility and hunting techniques, since aluminium boats are faster but can carry less weight, so that crews had to make shorter but more frequent hunting trips. Furthermore, this shift had important impacts on work patterns, as the overall number of people necessary to support one

hunting crew was reduced. Aluminium boats are smaller and so crews became smaller too. Besides that, with the use of outboard motors crews could also dispense with the paddlers. The whole processing of materials, construction and maintenance of skin boats, much of which was done by women, was replaced by imported boats and spare parts, as well as by the much less intensive and frequent maintenance required by the new boats, now done by men. This has important ramifications in the structural level of the sociocultural system, as will be discussed in the next section.

Industrially produced equipment and imported energy for hunting require some source of cash income. Cash has also become necessary for most basic and daily needs, such as heating, clothing, electricity, and housing. It must also be noted that the use of consumer goods that may appear at first as luxuries may become necessities at some point. For example, the use of fridges and freezers has replaced that of traditional storage technologies, and in the process, infrastructure and skills related to the latter gradually got lost.

On a general level, it seems reasonable to assert that increased involvement in the cash economy will reduce the overall engagement and output of the hunting-fishing-gathering economy. This is reflected in general shifts in diet. During my fieldwork, hunters or people with hunters in their households or families said they only eat hunted food between twice a week and once every two weeks. This can be studied with more precision by measuring the calories and/or protein intakes coming from both wild and store-bought foods. The relationship between the cash economy and subsistence hunting can also vary according to several factors.

First, there is the problem of time allocation. The need for cash means that time and work effort have to be invested in wage employment and/or the production of commodities. The extent to which remunerated activities constrain subsistence hunting, fishing, and gathering varies within and across communities, according to the nature of the occupations and the sources of cash income. For example, seasonal wage employment outside the hunting season (VanStone 1960), or the combination of small-scale commercial fishing with subsistence fishing (Langdon 1991), can reduce the scheduling problem. In Wales, while some manage to combine hunting and remunerated work through flexible jobs, others report not being able to hunt as much as they wish, due to time constraints. Also, several

families have ceased going to summer campsites, partly because at least some members are tied to job schedules. Furthermore, the only marketable commodities available in Wales are walrus ivory tusks and seal furs.³ Commercialisation of other locally available resources is prevented either by regulations, a lack of market demand, or both.

Second, the amounts of cash available can have different effects on subsistence activities. High fuel prices and limited cash income opportunities in Alaskan villages can severely restrict mobility for subsistence purposes (Brinkman et al. 2014). In Wales, several hunters reported this as being one of the main determinants of the frequency and length of their hunting trips, or even the possibility of hunting. At the same time, limited access to store-bought food increases the need for pursuing subsistence hunting, fishing and gathering. Thus, these activities still constitute for many communities an economically efficient and reliable mode of subsistence, as well as a source of high quality nutrition (Wolfe/Walker 1987). A study by BurnSilver and colleagues (2016) argues that in some North Alaskan communities, households with higher incomes tend to be able to engage more in subsistence hunting.

Third, involvement in the cash economy can induce changes in hunting prey selection. For example, with increases in cash income and the reduced necessity of hunting for subsistence, hunters may focus only on resources that provide status (Nowak 1988). Other shifts in prey selection can be induced due to insufficient cash and restricted mobility. Hunters in Wales may turn their focus onto smaller game, for example small seals, in times when less cash is available to buy fuel, since these are found nearer to the coast.

Finally, changes in the community's subsistence through increased participation in the wage economy may have effects on population structures and mobility. As was noted above, net migration is the main factor for demographic changes in Alaskan communities, usually in the form of net outmigration that in many cases offsets natural growth. Causes of migration and mobility can vary across communities and regions, and remain an interesting issue for further research. As my field observations suggest, seeking job opportunities and training leads some people to migrate to cities and regional centres, but in many cases, other structural factors may have to be incorporated to fully account for this phenomenon.

In sum, the adoption of industrial technologies and energy for subsistence, the combination of subsistence hunting, fishing, and gathering with wage employment and commercial activities, and the reliability on imported foods in addition to wild foods, constitutes the infrastructural dimension of what has been called mixed economies in the Arctic context.

3.4 Structure

Kinship is the basis of hunter-gatherer social organisation, as in other stateless societies. This does not mean that relations based on non-kin ties do not occur, but their extent and relevance within the system can vary across cultures. Inupiaq society, as Burch (1975: 22ff.) describes it in his ethnohistorical work, was “overwhelmingly kinship oriented”, in that “both ideally and actually, kinship ties were emphasized at the expense of all others”, and that “kinship was relevant in *all* social contexts in traditional Northwest Alaska.” Ellanna (1983: 50f.) writes that kinship in Bering Strait “was the means by which mutual interdependence, obligations, alliances, and other rules of interpersonal behaviour were defined”, as well as relations between families.

Inupiaq kinship systems diverged from other Inuit groups, such as for example those of Central Canada. Descent was reckoned bilaterally, but with a stress on the male line, that is, on patrilineal (or patrilateral) links, at least in some contexts (Ellanna 1988b; Oswalt 1967). Kinship terminology of Bering Strait Inupiat (including Wales) was described by Heinrich (1960; see also Schweitzer 2016) as a “three-cousin system”, a variant of Iroquois terminology that distinguishes cross cousins on both sides from patrilateral and matrilateral parallel cousins; and as an “affinal excluding system”, where consanguines and affinals are kept separated. A high level of endogamy existed at the local family level (see below), despite the absence of formal institutionalized rules (Burch 1975). Marriages were mostly monogamous, but polygyny was common, though less frequent (Burch 1975; Oswalt 1967). According to several informants in Wales, arranged marriages were not uncommon in the past. Parents would arrange the marriage of their children in order to establish a stronger link between them, for instance, because of particular (and complementary) skills of the other person. In other cases, marriages just had to be approved by the respective parents.

Burch (1975, 2006) describes traditional Inupiaq society as organised along extended family lines. Small communities were usually composed of one local family unit (what other authors call the band), while larger settlements, as in the case of Wales, were composed of two or more local families. These local families consisted of several domestic families (I prefer the term household) linked through kinship ties. Each domestic family or household included two or three closely related conjugal (or nuclear) families in one single dwelling. Local families constituted the main socio-economic unit, collectively owning tools and facilities, cooperating for productive activities, and pooling resources for consumption, although households could also fulfil these functions too (Burch 1988). The local family (one in small settlements, two or three in larger ones) was also the main political unit, as it was autonomous and controlled a territory, which included a winter village and several campsites for seasonal subsistence purposes. The latter were owned either by single households or by local families.

These broad patterns of social organisation are essential for understanding patterns of hunting crew affiliation. At the same time, understanding the functioning of boat crews among Bering Strait Inupiat is necessary for explaining socioeconomic and political patterns. Boat crews tended to have a relative stable composition through time, and ensured cooperation and solidarity across members of different households, as well as loyalty to a boat owner and leader. Crew members for hunting sea mammals were recruited by an *umialik* – a boat owner or captain – primarily among kinship lines, i.e., within his extended family and usually through patrilineal links. Women related through blood and affinal ties were in charge of processing game and raw materials (including skins for boat covering), storing food, and providing hunters with food. Crews were organised hierarchically, with the captain at the highest position, assuming responsibility for the crew and other people involved. Following the captain were the bowman and the helmsman, and at the bottom usually were younger apprentices who helped and supported the hunters. According to elderly hunters in Wales, it took years and even decades for a hunter to get to higher positions within a crew and eventually become a captain. “You have to climb the ladder up to the front of the boat”, where the elders and more experienced are, said one hunter. Thus, skills, experience, and relative

age were important in acquiring a higher position in the crew hierarchy, but also kinship and in particular the patrilineal link between the hunter and the boat owner were decisive, as Ellanna (1988b: 112) notes.

Boat crews were central in the distribution and potential accumulation of resources. Large game was appropriated by the crew and divided equally among its members, but the captain had priority of choice. Food was both cached and shared within the extended family by women associated with a crew, such as hunters' wives (Bogojavlensky 1969). Boat captains directed and supervised much of the division and distribution of game, especially of bowhead whales (Worl 1980). Since, as it was earlier stated, skin boats were essential for most subsistence and economic activities, boat owners were able to accumulate wealth and to control the means of production by limiting access to female walrus hides, which were necessary for boat construction (Bogojavlensky 1969; Ellanna 1988b). In fact, the Inupiaq term to designate a crew captain, *umialik*, has several related meanings, including boat owner, leader, boss, and rich man (Burch 2006: 66). Moreover, "captains continually dispense material goods, but they are repaid only in deference and service of an unspecified intensity and duration" (Bogojavlensky 1969: 106). Thus, the *umialik* can be described with Marshall Sahlins' category of "big-man" (Burch 2006: 67). It is important to note that it is not only the ownership of a skin boat that made a man an *umialik*, but also the command over a crew, with its support and loyalty (Bogojavlensky 1969: 108).

The crew captain's leadership was further established in the *qazgi* – the "men's house" or "community hall", which served as the place for dealing with internal and external political affairs, making and repairing tools, transmitting skills and knowledge, and ceremonial purposes. Each village had at least one *qazgi*, but larger settlements like Wales had several. Membership in the *qazgi* mirrored patterns of crew affiliation (Ellanna 1988b) and was acquired through patrilineal ties, though not exclusively (Ray 1992: 106). At least for the case of King Island, Bogojavlensky (1969) argues that boat crews equalled political factions in the village.

According to Burch (1975), demographic changes at an early period of contact through population declines and dislocations induced changes in kinship, such as the elimination of lines of descent and the mixing up of formerly endogamous and quite self-contained populations. These are

examples of ramifications of infrastructural factors in the structure of the sociocultural system. However, other shifts described by Burch in the same book cannot be reduced to the infrastructure: missions and Christianisation, formal education, and other state interventions induced directed changes in Inupiaq social organisation, such as for example, the elimination of polygamous and arranged marriages, the decrease in wife exchange, and the adoption of English terms through the loss of the Inupiaq language. Furthermore, and perhaps most significantly, Burch (1975) describes an overall decline in the importance of kinship for Inupiaq social organisation. This, he argues, was due to an increased participation of individuals in non-kin organisations, such as the wage economy, and with the establishment of modern state institutions taking over several of the functions formerly fulfilled by kinship.

In the case of the boat crew, while kinship, and in particular patrilineal links, continue to be the primary form of recruiting crew members, the internal structure of the crew has experienced some transformations. One technological change discussed in the previous section, namely, the shift from skin to aluminium boats, provided the opportunity to younger men to form their own crews by purchasing a boat, since cash was not controlled by existing elderly captains, in contrast to the case with walrus hides for boat construction (Ellanna 1988b). At present in the village of Wales, three out of five crews for which I collected data have young captains that recruited their members within their own generation and from one or two generations upwards. This represents a reversal of the hierarchical structure of crews. Functions such as providing for the crew and the hunting trips, as well as leadership and decision making do not lie exclusively in the hands of elderly men anymore. Furthermore, the means for acquiring a position of leadership and authority have changed to some extent. Having access to cash, for instance, through wage employment, has become an important factor to becoming a crew captain.

Another change in the crew structure is observed in the organisation of labour. In the previous section, it was described how part of women's labour directly involved with the hunting crew was rendered obsolete through the adoption of aluminium boats. This might be related to the fact that in Wales women appear to acquire more full-time and permanent jobs, while men rather tend to pursue seasonal employment and be able to

participate in hunting. Furthermore, a general flexibilisation in the sexual division of labour can be observed. Women are still largely in charge of processing food, but I could also observe instances in which either men alone or together with women would carry out such tasks. Also, the fact that some women have started to go hunting with boat crews in Wales (as well as in other Alaskan communities), something unconceivable until the recent past, is a sign of changes in gender roles and relationships within the economic and political spheres.

Not only the internal structure, but also the role of the boat crew within the whole sociocultural system has been transformed. The reduction of the people directly involved with a crew, combined with the increased participation of individuals in the wage economy, has generated an increased independence of individuals and households from the hunting economy. This affects social networks based on the sharing of hunted food. In her study of the community of Barrow, Bodenhorn (2000) found that many relations in such networks are based on balanced reciprocity between productive, i.e., actively hunting, individuals and households. Sharing networks may become less extensive as parts of the community become less engaged in hunting and thus unable to reciprocate. This is strengthened by the availability of imported foods and the overall decreased importance of local wild foods in the diet. In Wales, hunted food is rarely cached in communal drying racks and cellars anymore, but rather stored by individual households. The data collected during my fieldwork suggest a tendency towards limited sharing networks, where products obtained from the hunt are usually kept within the restricted circle of the household or shared with a few members of the family, at least on a regular basis. A significant part of the population seems to be mostly excluded from these networks. These aspects, however, should be further studied quantitatively. Other interesting issues for further study are the possibility of the emergence of distinct spheres of exchange, and how access to cash income is organised within the community; or, in other words, how cash is distributed among the population. While kinship seems to play an important role here, it may differ from traditional channels for distribution.

Changes in subsistence and technology – i.e., infrastructural factors – partly account for political transformations. As a consequence of the reduced importance of the hunting economy within the sociocultural

system, the sphere of influence of crew captains has become more and more restricted. This has eroded traditional forms of leadership based on the institution of captainship. Furthermore, an increased dependence of the whole sociocultural system on external energetic and material inputs (imported food, technology, fuel) generated a loss of autonomy and a de-localisation of the sources of power and decision making. As Pelto (1987: 166) puts it regarding the Sami case, the de-localisation of energy sources and means of production, from local to imported and commercially distributed ones, leads to a loss of local autonomy.

However, structural factors must be considered to explain these political shifts, as formerly autonomous and highly self-sufficient societal units became increasingly incorporated into state structures. By the end of the 19th and beginning of the 20th century, the gold rush in the Bering Strait area brought a large flux of white Americans into the region, who, in contrast to traders and whalers, settled and appropriated land. This process strengthened the presence of missions and schools in the villages and increased the interest of the U.S. government in imposing law in the region (Ray 1992: 246-250). The *qazgi* were gradually abandoned and state-like bureaucratic structures were established in the villages. This began with the passing of the Indian Reorganization Act in the U.S. (in 1936 in Alaska), and the creation of tribal councils in every village, which allowed the inclusion of customary law and a certain degree of autonomy. This process further advanced as the interest of the United States in the resources of Alaska increased. In 1971, after the political struggles of Alaska Natives during the 1960s, and at a time when the U.S. was starting to exploit the oil reserves in northern Alaska on a large scale, the Alaska Native Claims Settlement Act (ANCSA) was passed. Regional and village for-profit Native corporations were created and entitled to land and compensation payments. The rest of the land was divided between state and federal governments, and a complex system of regulation and management of natural resources, including fish and game for subsistence purposes, was established. Thereby, Alaska Natives became increasingly incorporated into state structures, markets, and global politics and economy.

Elders in Wales reported to me that when they were young, members of the tribal council were exclusively elderly men, usually hunters and crew captains. Local accounts of the tribal council in past times suggest that it

also had a function of social control, e.g., of imposing sanctions on individuals who broke the rules. Since then, a general move away from traditional forms of politics and leadership towards state-like bureaucracy has taken place. Today, the tribal council works as an administrative entity and is the main link between the community and external structures and organisations. With a local economy now largely dependent on state transfer payments and subsidies, the tribal council has assumed new functions such as seeking funds and grants for the community and its members. Council members are elected by vote. While kinship relations still constitute a relevant factor in the politics of the council, it is not uncommon to hear people disapproving of this logic and describing it as nepotism. At the times of my visits, the great majority of the people working at the tribal council and the village corporation were women. Non-hunters also participate in such entities. In sum, the means for attaining power and pursuing political careers have shifted to some extent from traditional forms of politics and leadership based on hunting, kinship, and seniority, to those characteristic of modern states and industrial-service economies, such as democratic elections.

4. Discussion and conclusions

With this case study, I have attempted to illustrate how a materialist research strategy can be applied to the study of the sociocultural change of hunter-gatherers in industrial contexts. Though there are certainly gaps and issues that require further and more accurate research, my main purpose has been to explore general relations. Furthermore, my objective was to show that a revised principle of the priority of the infrastructure, as a nested hierarchy of progressively more limiting constraints (Ferguson 1995), should allow the search for causal regularities in structural levels to explain short-term historical processes. In this way, Ferguson argues that “cultural materialism could become more of a general frame of reference for those who seek to understand how the different components of socio-cultural systems fit together” (1995: 28).

It has been demonstrated that to explain patterns of historical change, a certain (though limited) causal autonomy within each layer of a socio-

cultural system – infrastructure, structure, and superstructure – must be considered, as causal relations beyond the priority of the infrastructure have to be sought. On the one hand, changes in the structure have been explained as ramifications of infrastructural changes. Thus, in my empirical case study, changes in kinship have been partly accounted for by population declines and dislocations. Similarly, transformations in household and hunting crew organisation, distribution of resources, gender roles, leadership and politics have been explained to a certain degree through shifts in hunting and transportation technology, as well as changes in subsistence through reduced hunting and the introduction of wage employment and imported foods.

On the other hand, a certain causal latitude exists within each level, since factors for explaining phenomena have been sought within the same systemic level. At the level of the infrastructure, demographic changes effected shifts in subsistence such as increased specialisation in walrus and seals and decreased hunting of whales due to a smaller human population. New technologies and the incorporation of wage employment also induced changes in subsistence and work patterns. At the level of the structure, formal education and missions transformed the kinship system; the introduction of non-kin organisations and institutions diminished the importance of kinship as an organizing principle for society; changes in labour and household organisation affected gender roles and political leadership; and the progressive incorporation of the sociocultural system into the state produced changes in political institutions and organisation. In most cases, changes in the structural components of the system dealt with in this paper have been effected by both infrastructural and structural factors. For example, changes in kinship have been explained through changes in population (infrastructural), and through missionary activity as well as the establishment of non-kin institutions (structural).

It is important to note that most of the factors for historical change here described correspond to changes in the social environment, specifically through the expansion of industrial society. However, when identifying the causes for the transformation of particular sociocultural elements, we may distinguish between endogenous and exogenous factors, the former being within the system and the latter coming from the social environment. When changes in kinship are explained through the establishment

of missions and non-kin institutions, we are speaking of exogenous factors, that is, changes in the social environment. When we explain transformations in leadership and politics through changes in the social organisation, such as, for instance, the decreased importance of kinship and changes in labour and household organisation, then we speak of endogenous factors. Furthermore, the causal relationships established within and between the systemic levels imply that as one element changes (for example, through exogenous factors), the others may have to rearrange. For example, as the hunting crew changes its structure and function and becomes less important within the system, other components such as leadership and politics, organisation of labour, and gender roles are reconfigured.

As was noted before, superstructural phenomena fall outside of the focus of this study. However, the same argument applies here. On the one hand, we have changes in superstructural aspects that can be tracked back to changes in the infrastructure, or eventually only to the structure. For instance, in the early period of contact, changes in hunting technology and methods effected the breaking and eventual abandonment of taboos, norms, and beliefs related to hunting. On the other hand, the fact that missionary activity and the schooling system acted directly upon these and other beliefs, norms, and values for the purpose of replacing them with new ones, makes it impossible to reduce these changes exclusively to infrastructural factors. Thus, explanations for some superstructural changes will have to be sought in the structure or the superstructure. In the historical time scale considered, both types of causal relations (between and within systemic levels) may appear as parallel and simultaneous. Moreover, it should be considered that superstructural elements, such as formal education, the adoption of Christianity, or the ideological rejection of politics through kinship, can act as positive feedbacks reinforcing changes already taking place in the rest of the system.

In this case study from Alaska, the focus has been on the various infrastructural and structural factors that affected an economy which was traditionally organised primarily around large marine mammal hunting. I have attempted to show that the mixed economy comprises both infrastructural and structural levels. In particular, the role of boat crews for hunting has been discussed as a sub-system closely related to broader patterns of social, economic and political organisation. In the context of

a mixed economy, the boat crews' role within the sociocultural system has changed. Other sub-systems or sectors such as the market and wage economy and state-like bureaucratic structures have been incorporated into the sociocultural system, interrelating with traditional ones. In the process, cultural traits and institutions become transformed in structure and function, or even displaced. The institution of the hunting crew and crew captainship has lost overall importance, and sociopolitical forms characteristic of states and industrial-service economies have gained ground. Furthermore, while kinship has retreated from some spheres of social life, and while the traditional kinship *system* has ceased to exist as such, the importance of kinship *ties* continues to be of significant importance for organising social relations and economic activities. Even though, with the adoption of industrially produced technologies and fossil fuel, part of the productive process and the means of production have been displaced from the local economy, the household and family groups, albeit at times smaller than before, continue to be the main economic units where production and consumption take place and are organised. This corresponds to the general pattern found in other Arctic communities with mixed economies (Usher et al. 2003).

In the context of the incorporation of hunter-gatherers into larger societies, and the emergence of mixed economies, it is important to identify and explain which, how and under which conditions hunter-gatherer sociocultural features persist, disappear, or become transformed. Variations in outcomes will depend on the particular society in question and its traditional structures and institutions, as well as their particular social environment. The approach presented here should serve to account for such variations.

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- 1 Inupiat is the plural form and the name of the people; Inupiaq is the singular as well as the adjective form, and the name of the language.
- 2 Fieldwork was kindly supported by the International Society for Hunter Gatherer Research (ISHGR) and the University of Vienna.
- 3 The selling of raw ivory is allowed between Natives, and only processed ivory (for example, in the form of carvings) can be sold without restrictions.

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ABSTRACT *Der Artikel stellt eine materialistische Forschungsstrategie zur Untersuchung historischer Prozesse des Wandels von Jäger- und Sammlergesellschaften bei ihrer Integration in die Industriegesellschaft vor. Zwei Aspekte werden diskutiert: 1) ein theoretisches Modell soziokultureller Systeme für die Kategorisierung von Phänomenen und 2) ein theoretisches Prinzip für die Identifizierung von Kausalverhältnissen. Illustriert wird der Ansatz mit einer Fallstudie über die Transformationen einer Inupiaq-Gemeinschaft in Alaska. Dabei werden unterschiedliche Aspekte des soziokulturellen Lebens angeschnitten, wie Population, Subsistenz, Technologie, soziale Organisation, Ökonomie und Politik. Der Fokus liegt auf der sich wandelnden Rolle der Ökonomie des Jagens und der damit verwandten Institutionen.*

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SARAH-JANE DRESSCHER
Food Security in the High Arctic While Balancing the Demands of Commercial and Subsistence Hunting¹

ABSTRACT *Russian hunters-fishermen-tradesmen went to Svalbard during the 18th and the first half of the 19th century to hunt for marine mammals and fur bearing animals and were away from home for over a year. They were under considerable stress because of the need to be economically successful and to survive in the High Arctic. What were their food security strategies? How did they balance the subsistence hunt with the commercial hunt? In this article, data from different disciplines are used to analyse the food security strategies and explicate how they managed to balance the subsistence hunt with the commercial one in the High Arctic.*

KEYWORDS *High Arctic, subsistence hunt, commercial hunt, food security, Pomors*

1. Introduction

It is not easy to survive in the High Arctic, but the Russian hunters (Pomors) succeeded in living and working in the remote area of Svalbard for periods of 18 to 24 months during the 18th and the beginning of the 19th century. In Russia, these hunters lived in sedentary settlements with markets and trade routes to Moscow, England and the Netherlands. By going to Svalbard they could not fall back on the safety that a town with food markets had to offer. During the hunting expeditions to Sval-