Subsistence Trends in a Modern Eskimo Community

MICHAEL NOWAK[1]

ABSTRACT. While Eskimos of Nunivak Island, Alaska, still engage in traditional subsistence activities, they require an adequate cash income in order to acquire and maintain the equipment needed for such activities. In this paper traditional subsistence modes are examined as well as the economic opportunities that permit the Nunivagamiut to maintain them. The use of imported food in part reflects the degree to which a family is unable to participate in its traditional culture. It is indicated that at least part of this inability is of an economic nature.

RÉSUMÉ. *Tendances de la subsistance dans une communauté esquimaude moderne.* Bien que les Esquimaux de l'île de Nunivak en Alaska s'occupent encore à des activités traditionnelles de subsistance, ils ont besoin d'un revenu comptant adéquat pour se procurer l'équipement nécessaire à ce genre d'activités et pour l'entretenir. Dans le présent texte, l'auteur examine les modes traditionnels de subsistance de même que les possibilités économiques qui permettent aux Nunivagamiut de les maintenir. L'emploi de nourriture importée reflète en partie le degré selon lequel une famille ne peut plus participer à sa culture traditionnelle. On indique qu'une partie au moins de cette incapacité est de nature économique.

РЕЗЮМЕ. *Изменение образа жизни современной эскимосской общины.* Несмотря на то, что эскимосы, населяющие о. Нунивак/Аляска/, попрежнему заняты традиционными промыслами, они нуждаются в определенном денежном доходе для приобретения и содержания в исправности необходимого снаряжения. В настоящей статье наряду с традиционным образом жизни нунивагамиутов рассматриваются и экономические возможности, позволяющие поддерживать его. Потребление привозных продуктов питания частично отражает степень, в которой эскимосская семья отходит от участия в традиционной культуре. Показывается, что в определенной мере такое положение вызвано экономическими причинами.

INTRODUCTION

Eskimo nutrition has been the subject of numerous reports in the past. Their diet has always fascinated the Americans and Europeans, who are impressed by the fact that it consists almost entirely of flesh. No attempt will be made in this paper to review earlier findings, some of which have been generalized to apply to Eskimo-speaking peoples as a whole. A few issues brought out in earlier studies will however be discussed specifically for their relevance to the population studied here; and a number of points regarding the village studied will be presented, and their significance discussed in a concluding section.

Mekoryuk is the single presently-occupied village of Nunivak Island (Fig. 1), although both historic accounts and archaeological work indicate that many more were occupied in the past. The community numbers about 250 people, a population which, because of emigration, has remained relatively stable over the past decade. Over two thirds of the adult males still engage in some form of aboriginal subsistence activity — many of them in more than one at certain times of the year.

[1]Department of Anthropology, The Colorado College, Colorado Springs, Colorado, U.S.A.

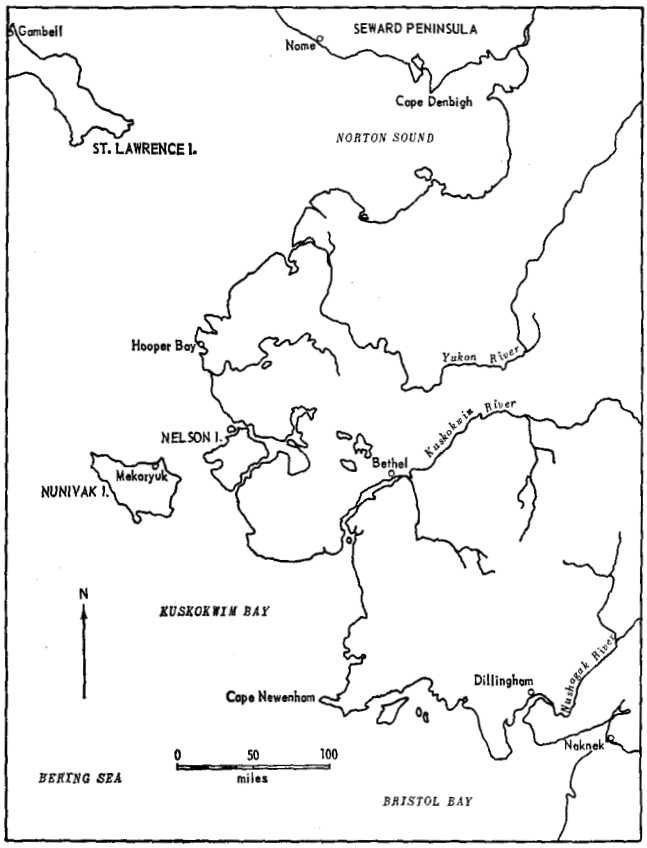

FIG. 1. Western Alaska.

An even higher proportion of the women engage in the gathering of plants and shellfish, although some do not participate regularly enough for their work to be regarded as true subsistence contributions. Many women also ice-fish during the winter. These comments lead up to the first point to be made in this paper: that by and large the families of Mekoryuk still acquire much of their food through traditional subsistence activities. Some families are exceptions to this statement, but they constitute a definite minority of the community.

Lantis (1946) has reviewed the traditional calendar of subsistence activities for the people of Nunivak Island, and in the sense that it was based on the seasonal availability of the animals (or plants) sought, her research can still be said to apply to present-day inhabitants of the island. By the middle of June the village is usually half empty because many families have gone to fishcamp. Others leave in early July. Some did not go at all during the summer of 1973 due to having jobs with the construction projects for sewers and water supply or the reindeer slaughter-house, though they generally go when such jobs are not available. Several asked their employers for leave to go to fishcamp for two weeks, and it was generally granted.

If one examines the means by which the Nunivagamiut pursue their traditional subsistence activities, it will be seen that (1) they have become highly dependent

on the products of western technology (machinery and other equipment such as rifles), and (2) with that dependence has arisen a strong need for a cash income with which to purchase and maintain such equipment. Hall (1971) and Pelto (1973) have both discussed this point with regard to other regions of the Arctic, pointing out the far-reaching consequences of a switch from purely subsistence activities to ones which yield a cash income.

OPPORTUNITIES FOR CASH INCOME

The year during which the present study was made (1973) is atypical with respect to the number of available jobs providing a cash income. Three projects funded by the U.S. Government were under way that year, all of them utilizing some local labour. First, the U.S. Public Health Service was in the second year of a major construction project which would provide running water and indoor toilets for every home in Mekoryuk. This project was completed in the November, and had provided employment for 8-10 men since its start. Secondly, a new reindeer slaughter plant had been under construction since the summer of 1972, and was also scheduled for completion in the fall. Unlike in the case of the water and sewage project, work on the reindeer plant did not proceed through the winter. Twelve men were employed on the slaughter plant. The third project involved airstrip improvement and the construction of a new road.

TABLE 1. Regular jobs in Mekoryuk

Job	No. of employees
ASHA (Alaska State Housing Association)	1
AVEC (Alaska Village Electric Corporation)	2*
BIA (Bureau of Indian Affairs and School)	5
BSRP (Bering Sea Reindeer Products)	8** (30)
Fire Protection***	1
Headstart (a U.S. federal educational programme)	5
Health Aid	1*
Magistrate	1
National Guard***	2*
Native store	3
Police	2*
Post Office	2
Wien Alaska (airline agent)	1
	34 Total permanent wage jobs
Additional income, not on a fixed wage basis:	
NIMA (Native Industries, Mekoryuk, Alaska)	15***
Muskox wool knitting	20***
Fox pelt sales	5***

*1 principal employee, 1 substitute or assistant
**permanent employees
***part-time work (individuals often hold other jobs as well)

The summer of 1973 was unusual in that almost every male who wanted to could find local employment on a wage-earning job. On a more permanent basis, 34 jobs exist in Mekoryuk which provide a steady income. These are itemized in Table 1.

Whether the opportunities for getting wage-earning jobs are significantly greater in Mekoryuk than in other Alaskan villages of comparable size cannot be determined in this paper, since the author lacks equivalent information concerning them, but it is apparent that the people of Mekoryuk have good opportunities for local, permanent employment. If the number of available jobs is estimated at 34, about half of the available manpower could be employed on local, permanent work. Actual incomes are in many instances considerably higher than those derived from permanent jobs, because many families earn additional money through the manufacture and sale of native products. About a third of the adult women knit quivut (the soft underwool of muskoxen) into mittens, hats and garments which are mostly sold in outlets in Anchorage. The sale of fox pelts provides additional income for the males who engage in some trapping in the winter — about eight in 1973.

Another factor that must be taken account of in a consideration of income per family is the phenomenon of "nesting jobs", which concerns the holding by a single individual of more than one regular wage job. It usually occurs in families, and tends to concentrate income, especially in cases where both husband and wife are wage earners. Because of nesting, as well as the cases of both husband and wife working, the highest family income in Mekoryuk is over $20,000 per annum.

Several families depend entirely on welfare payments for cash income. These are as high as $10,320 for a family with nine dependents. Families that are small are usually those of relatively young couples, and have at least one steady wage earner. It is difficult to delineate a minimal income for a Mekoryuk family, because of some of the factors discussed above, but it appears that $3,120 per year is the lowest amount paid for a wage job, which is however for only part of the day, so that the individual holding it can easily, and does, take on an additional job. Average income for Mekoryuk is approximately $6,200, a figure which takes no account of the temporary construction projects underway during the summer and fall of 1973, as it is based on the 1972 calendar year.

COST-OF-LIVING

Cost-of-living figures often applied to Alaska as a whole fail to portray Mekoryuk conditions accurately. The prices of all articles purchased outright include, as elsewhere in the Alaskan bush, transportation charges which commonly add 40-80% to original price. A number of expenses that normally account for a considerable part of a pay cheque are however either free or else available at minimal expense. Health care is provided free of charge to Alaskan natives, and all of the permanent residents of Mekoryuk fall into this category. In December 1972, 14 ASHA houses were completed and occupied. These carry 30-year mortgages, on which the owners pay $16 to $32 per month, depending on which of

two types of houses they live in. Furthermore, an individual may work on the completion of his own house; if he puts in 300 hours, his monthly payments are reduced by a half.

Utilities are very expensive in Mekoryuk. The new ASHA houses often require 55 gallons (250 litres) — one drum — of stove oil per week in the winter, and the price in the summer of 1973 for a drum of stove oil was $30. Some houses (usually older and smaller ones) can however be heated, and their occupants cook, on a drum of oil for 16-24 days in the winter. Oil consumption in summer is about a third of that in winter. AVEC minimum charges for electricity are $15 per month. Electricity costs 17 cents per kilowatt hour beyond the 10 KWH allotted in the minimum charge for the service. Gasoline for snow vehicles or outboard motors costs 90 cents per gallon (4.5 litres) if purchased by the drum, or $1.11 if purchased by the gallon; and lube oil (which is mixed with gasoline for two-cycle engines) costs $19.20 for a case of 24 quarts (27 litres). The usual operating ratio is one quart of oil to five gallons of gasoline, and so the total price of prepared fuel amounts to $1.27 per gallon, or $1.06 per gallon if the gasoline is charged for by the drum. In April 1974, petroleum prices were increased by 25%.

Very few of the inhabitants of Mekoryuk purchase groceries in bulk quantities by mail order, but rather as needed on an item-for-item basis from the Mekoryuk Native Store at prices that range from two to three times Seattle prices. Comparable ratios exist in respect of non-food items such as hardware, clothing, and parts for motors. Costs of groceries vary over a wide range, but estimates (based on a family of six) for light, medium, and heavy use of store-bought items are $120, $200 and $280 per month respectively. Adding up just the basic monthly expenses and averaging as between summer and winter, it is found that a family of six would pay $436 per month for these groceries.

Despite living costs, the inhabitants of Mekoryuk generally appear to have money left for purchases over and beyond those mentioned above. Mekoryuk has about 200 snowmobiles, or an average of 4.5 per family. Slightly more than half of these are in operable condition. Outboard motors are used in pairs for sea travel and average in number at over five per family. Almost half of the families have more than one boat, although the second is usually older and used for river and local travel only. Maintenance of both snowmobiles and outboard motor boats constitutes a major expense for all families in Mekoryuk, but none appears to be seriously handicapped by lack of funds for such maintenance.

TRADITIONAL SUBSISTENCE PATTERNS

If attention is shifted from the opportunities of people in Mekoryuk to acquire cash incomes to their traditional subsistence patterns, it becomes apparent that they still obtain much of their basic foods from traditional hunting and fishing activities. In June 1973, almost half of the villagers were at summer fish camps catching and drying salmon — mainly dog salmon *(Oncorhynchusketa)* — so as to obtain a year's supply of it for food. Although size of catch varies, most families return with 200-500 fish caught over a two-to-four-week period. Some of those who go to fishcamp hold regular jobs, and simply take leave during their absences.

During the summer of 1973 the men who did not go to fishcamp were young, usually still unmarried, and working on one of the construction projects.

Other subsistence activities do not involve as long a period of absence and usually concern only certain members of a family (usually the head and/or older sons). Spring seal hunting is normally a two-to-four-day activity, while bird hunting and halibut fishing take one day, as do most gathering activities. Reindeer hunting (each family is allotted four) is most frequently done in conjunction with the rounding up of the animals for slaughter which occurs in August. Greens may be gathered from the middle of July through August, the principal variety gathered for winter storage being sourdock *(Rumex articus)*. Wild celery *(Angelica lucida)* is also gathered avidly during the summer, but is consumed fresh. Villagers state that it turns bad when stored in barrels, but one woman will freeze a little in summer to see whether it can thereby be kept for winter consumption. Women not born on Nunivak mention that other plants not consumed on the island are eaten in the areas from which they come. Sourgrass *(Oxyria digna)* is found in the western portions of Nunivak Island along bluffs. It is eaten fresh and may also be added to sourdock and berries in barrels.

Both types of berry collected by the present-day people of Nunivak Island are ripe by the middle of August when women and children can be seen collecting them on the tundra south of Mekoryuk. Amounts gathered vary widely here too, but a family of six which plans to use them during the winter will try to have about 50-75 pounds (23-34 kg) of cloudberries (*Rubus chamaemorus*) collected for this purpose and another 30 pounds (14 kg) for more immediate consumption. Blackberries (*Empetrum nigrum*) are gathered in smaller amounts and added to sourdock in barrels. Bog cranberries (*Oxycoccus microcarpus*) are also picked by the people of Mekoryuk, but are not found in sufficient quantities to constitute an important part of the berry harvest.

Although seal hunting takes place mainly in the spring (and only to a lesser extent in the fall), seals are taken whenever they are seen. Since usually only one, or at most a small number, is taken at any one time, seal meat is not stored, but rather consumed fresh. The amount of time spent seal hunting varies greatly — some individuals go only a few times per year, while others will hunt them at every opportunity. A typical adult male of Mekoryuk might go sealing three or four times in the spring and an equal number of times in the fall, securing perhaps 6-10 seals in all. Most of those taken are ringed *(Phoca hispida beaufortania)* and grey *(Phoca vitulina richardi)* seals, although a few hunters may secure two, or even three, bearded (*Erignathus barbatus* nauticus) seals during a year. The latter species, being much larger, is particularly prized for both its meat and hides. Ugruk, the hides of bearded seals, provides the boot soles for mukluks which are still made by many women in Mekoryuk. The wearing of them appears today to be generally restricted to occasions when the people customarily put on native dress. Older people can however still be seen using them for everyday wear.

Today seals still provide a number of products for consumption in addition to their meat. Oil is obtained by cutting strips of blubber, and putting these into a sealskin poke for roughly a year, during which time the blubber breaks down into a clear oil that is a basic part of the Mekoryuk Eskimo's diet. Seal oil is found on

the table for every meal except breakfast. Foods are cooked with a little seal oil added for seasoning; those consumed raw or fresh (some greens and dried meat) are dipped into a dish of seal oil before being eaten. Seal intestines are removed, cleaned, and separated into inner and outer layers. In the case of the bearded seal, the outer layer of intestine is eaten, while the inner is unrolled and allowed to dry, after which it may be stored or else used immediately after being cut open and into strips to make rain parkas.

Bird hunting often accompanies other activities such as fishing, although people (mostly men and older boys) may also go on hunting trips with the specific object of securing birds. Although a wide variety of birds are hunted, the following account concerns those of greatest economic importance — ones that were actually seen, or else figured prominently in accounts of bird hunting.

Ducks require first mention. The eider variety *(Somateria molissima* and *Somateria spectabilis)* appear and are brought home by late April. Other birds that are shot by early-to-mid-June include geese (*Branta* spp.) and ptarmigans (*Lagopus* spp.). Some birds appear to lay their eggs in very early June. Generally, the hunting of birds occurs whenever individuals are motivated to hunt them during the summer, although the activity appears to be at its peak just after a species arrives, and again just before it departs. With the increasing ownership of freezers in Mekoryuk, the freezing of birds is becoming an ever more common method of storing them.

Several species of birds (but especially cranes) are sometimes brought back from hunting trips as very young chicks, which are then raised as tame pets in a household and either released, or else killed and eaten, when they become mature. This practice has been observed in three families who make new captures of baby birds at intervals of perhaps once a year, but it does not appear to be common in the village of Mekoryuk.

Shellfish are collected on the west bank of the Mekoryuk River where it broadens to become Mekoryuk Bay. The vast majority of the shellfish collected are mussels *(Mytilus edulis)* which are consumed fresh, the shells being broken open and the meat dipped in seal oil before being placed in the mouth. Seaweed (usually *Rhodymenia palmata*) is commonly eaten with mussels. Other varieties of shellfish such as butter clams *(Glycymeris subobsoleta)* and cockles *(Clinocardium nuthalli)* received mention in the course of discussions about seafood eaten, but they were not seen either to be gathered or eaten during the period of the present study.

Not all families consume shellfish in equal quantities. It was in general those having the most traditional diet who were observed to spend the most time securing, and later eating, both shellfish and seaweed. Many families indicated that they ate shellfish only once in a great while, a number of persons saying that they do not now eat any, although they used to in the past. In general, therefore, shellfish do not appear to contribute significantly to the diet of more than a few Mekoryuk families, and cannot be said to constitute an important part of the food consumption of the village.

Tomcod *(Boreogadus saida)* is the principal fish caught during the time ice covers Mekoryuk Bay and Mekoryuk River. Usually tomcod fishing is done by

women, although it is by no means confined to them. The numbers caught depend both on how the fish are biting and how long persons spend fishing. Individuals observed in the course of the present study would be out generally from three to five hours, and bring back 30-80 fish. Bullheads (*Cottidiae* spp.) are often caught with tomcod, although in smaller quantities. From observations made it seems that they might account for about 10% of the total catch. Ice fishing on the Mekoryuk River usually occurs over a four-month period, beginning in middle to late December and running through April.

The four reindeer that each family is allowed to take for subsistence during a year contribute substantially to basic diet. The meat is either dried or frozen, and then used in a stew or "soup". A dressed reindeer weighs about 100 pounds (45 kg), so a family has access to 400 pounds (180 kg) of reindeer meat, provided it is prepared to do the necessary hunting. Permits costing $20 for each reindeer are issued by the Bering Sea Reindeer Corporation, which is the agency responsible for the general care and maintenance of all reindeer on Nunivak Island. The reindeer project was turned over to Mekoryuk for a five-year experimental period in 1970 by the U.S. Bureau of Indian Affairs. At the end of that period it will be reviewed, and will revert to management by the Bureau if it is not found to be making sufficient profit to be an economic asset to the village.

Muskoxen are not available as a food source, since they are protected animals on the Nunivak National Wildlife Refuge. Other land mammals are quite small (foxes are the next largest), and do not figure in the diet of the people. Walrus are the largest mammals hunted; although their tusks are prized for the carving material that they provide, their meat does not appear to be particularly liked (it is extremely tough for one thing), and there are now reports about hunters who keep only the heads (with the tusks), letting the rest of the animal rot. The toughness of walrus flesh is best reduced in soups, in which it is mainly used.

THE ECONOMICS OF MEKORYUK'S TRADITIONAL SUBSISTENCE ACTIVITIES

Two factors stand out in a general assessment of traditional subsistence activities on Nunivak Island. First, the per capita income of the inhabitants of Mekoryuk is high enough to allow them to spend a considerable amount of this income on the equipment required for the various aspects of hunting and fishing. Secondly, most individuals holding wage jobs are able to leave these for periods of time long enough for them to successfully undertake at least minimal hunting and fishing and so to enable their families to eat traditional foods for at least part of each meal. Some people do run out of dry fish before the coming of the next fishing season, but they are usually able to purchase additional quantities of it from others in the village who have a surplus. The same applies in the case of seal oil and other traditional foods.

In virtually no instance does a family which runs out of native foods face hunger, since a variety of foods can be purchased through the Mekoryuk Native Store, or an emergency loan or food stamps obtained free of charge through emergency funds of the Bureau of Indian Affairs, should a difficult situation arise.

Traditional subsistence activities today involve considerable cash outlays for

the purchase of plywood for boat construction, and of outboard motors, gas and oil or snowmobiles. While credit is available for some of these expenditures it generally has to be redeemed before being again extended, so outright purchases are made in many instances. A poor family is quite unable therefore to participate fully in the intense traditional subsistence activities that are required to produce a really adequate supply of native foods. Thus, a situation has been created in which a family may engage in as much hunting and fishing as it is able to accommodate, economically, adding purchased foods to its stock as needed or desired.

The general economic pattern in Mekoryuk is difficult to evaluate. Almost all families purchase staple products from the Native Store, but some go considerably beyond others in making additional purchases such as of canned fruits, soda pop, frozen and canned meats, and cake mixes. Items considered to be staples include coffee, flour, sugar, bread and crackers, jam, peanut butter, margarine, tea, onions, rice, and shortening. Presently only two families regularly order these items in bulk quantities (i.e., by case, etc.) from Seattle or Anchorage. Such a practice requires the ability to plan and order food supplies between three and six months in advance, but can result in substantial savings.

The more acculturated families tend to make greater use of non-native foods; either husband or wife, or both, will have spent time outside of Mekoryuk, and in the process have perhaps encountered, and acquired a taste for, these foods. Younger families are also more prone to make use of a variety of convenience foods that have captured a significant proportion of the general food market in North America over the past decade. These foods are stocked by most families in readiness for times when they may be too busy to spend much time cooking; but some younger families make far more than "emergency" use of them. As elsewhere, such foods are quite costly in terms of food value, but stable wage incomes and food stamps make them available to most families.

In five instances families about to depart for fishcamp were observed in the course of shopping, and the amounts and kinds of groceries they purchased at the Native Store revealed that several went far beyond the purchase of basic staples for their three-to-four-week stay at fishcamp. Cases of soda pop and large quantities of candy were included primarily, but not exclusively, for the children. In many instances over $100 was spent on these purchases, which included canned meats and stews as well as staples.

In overall terms it is apparent that, while the Eskimos of Mekoryuk still eat considerable quantities of native foods, they also rely heavily on store-purchased foods. The estimate arrived at in this paper, based as it is on four months of observation and discussion of the Mekoryuk Eskimos' diet and food habits, is that between a quarter and slightly more than half of their total food intake consists of store-purchased foods. Bulk purchases from Anchorage and Seattle are taken account of in this estimate.

As has been pointed out, the reason that native foods account for as much of the total diet as they do is that the income level of the inhabitants of Mekoryuk is sufficient to permit of far greater than minimal participation in traditional subsistence activities. It appears that inhabitants of other villages of the Yukon-Kuskokwim Delta region are often too poor to undertake very extensive hunting and

fishing because they cannot purchase or maintain the equipment needed for such activities (Mason 1973).

The estimate presented above regarding the proportion of native food to imported food among Nunivak Eskimos must be viewed with some caution inasmuch as observations did not extend over an entire year, or involve 24-hour dietary recall or other continuous surveillance. Some recent Canadian experiences indicate that both natives and casual observers frequently overestimate the proportion of native to store-bought food. Nonetheless, the Eskimos of Nunivak Island do appear to consume appreciably more native foods than do other southwestern Alaskan Eskimos (Jorene Hout, Yukon-Kuskokwim Health Association, personal communications 1973; Fortuine 1966).

In terms of nutritional adequacy, the diet of the present inhabitants of Nunivak Island appears to be good. Abundant amounts of protein and fats are supplied in the traditional foods, and non-native foods provide a plentiful supply of carbohydrates. Today additional nutrients (see Appendix 2) are provided for those who need them — especially expectant mothers and young children.

CONCLUSION

Emphasis in this study has been on an assessment of present-day diet in an Eskimo community. While data gained by direct observation were restricted to a four-month period (April to early August), familiarity with this area and its inhabitants, gained over three previous summers, greatly aided the author in making the study. Some of the persons who supplied information have been known to him for seven years.

The conclusions which follow certainly cannot be applied blanket-like to Alaskan Eskimos, even those of Southwestern Alaska. Rather, Nunivak Island and its inhabitants appear to reflect certain trends that are evident in the Arctic today. These, because they are related to stresses occurring in the process of Eskimo and Indian acculturation, appear to be remarkably similar to those reported from other widely-separated parts of the North American Arctic. (See Fortuine 1966 and Schaefer 1971 for a discussion of diet-related health problems in Southwestern Alaska and the Canadian Arctic, and Jenness 1962, 1968 for social and economic factors.)

It became apparent in the course of this study that the traditional subsistence activities of the Nunivagamiut are very closely related to economic position. As acculturation proceeds, even traditional elements of Nunivak Eskimo life have become very subject to evaluation in monetary terms. The islanders' ability to procure native foods is a direct consequence of their having the time and equipment needed for this pursuit. Reliance upon imported foods is substantial, although apparently less than that of many other Southwestern Alaskan communities (Fortuine 1966; Jorene Hout, personal communication).

It seems that the inhabitants of Mekoryuk are presently in a position where their income is adequate to enable a significant amount of aboriginal subsistence activity to continue, as well as purchases to be made of imported foods desired and required to complete what appears to be a nutritionally-adequate diet.

To what extent the situation existing during the 1973 study period may be projected into the future is not certain, since the author has witnessed many rapid changes during repeated absences of as little as a year. Even as the wage-providing projects were being completed and closing down in November, a number of Mekoryuk families were preparing to move to places on the Alaskan mainland where similar jobs were available. The past history of families leaving Nunivak Island for jobs in larger communities like Bethel is mixed. Most of them have made the psychological and social adjustments necessary for living in far larger communities, returning to Mekoryuk during vacations and to visit relatives. Some families have returned permanently after absences of several years, apparently never quite making the adjustment to the impersonal life that larger communities offer.

By April 1974 about one quarter of the families that had left Mekoryuk in the previous November had returned. There are both social and economic stresses to resolve upon such a return to Mekoryuk. Many of the social aspects of life in a larger community simply do not exist in Mekoryuk, so that many life-styles and tastes acquired in a larger community like Bethel have to be drastically modified or even abandoned. A returning head of household will have more difficulty securing employment in Mekoryuk than in the town he left. This fact alone may force an abandonment of much of the newly-acquired life-style. All of the families that left Mekoryuk in November had previously spent periods of time away from Nunivak Island, and so perhaps were preconditioned to the move. The fact of their returning is possibly an indication of cumulative stresses never before faced by the family units.

An attempt has been made in this paper to demonstrate that, in the final analysis, whether an individual chooses to pursue traditional subsistence modes of life, or else is a wage earner who has only limited time to hunt and fish, he needs a supply of cash. The difference between the two modes can be noted in how that cash is spent. Some of the Nunivagamiut spend most of their money on equipment needed for the pursuit of traditional subsistence activities, while those in wage jobs frequently allocate a considerable percentage of their income to the acquisition of consumer goods such as radios, record players, household conveniences, and other items not related to subsistence modes of living. Mekoryuk has progressed into the modern world to the extent that it is exceedingly difficult, if not impossible, for its inhabitants to subsist without some form of cash income.

This study should conclude with a word of caution. In his visits to Mekoryuk since 1967, it has become apparent to the author that changes occur at an extremely rapid rate. Data collected one year usually have to be extensively modified the next. To this extent, the author will continue to visit Mekoryuk when possible to try to follow up some of the issues made apparent in this study. By the time this paper appears in print much of the information contained in it will be of historical value only.

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APPENDIX 1: Mekoryuk's school lunch programme

The following comments are based on data collected during four periods of observation at the elementary school of the Bureau of Indian Affairs at Mekoryuk. Two visits were made in April 1973 and two in early May. The school has four regular teachers, but due to a foster child programme (in its third year), there are in addition two special education teachers. The number of regular students is 70, and they live in Mekoryuk.

Lunch is usually served between 11.30 a.m. and noon. Student helpers set tables and take servings of the various hot and cold dishes to them. Some items such as butter, peanut butter and jam are placed on tables, and students share them. A hot (main) dish is served at each meal, except when the cook is away, at which times soup and sandwiches may be substituted for it. The hot-lunch menu for 14 May, which appears to be typical, is set out in detail in Table 2.

TABLE 2. Typical hot-lunch menu

Item	Quantity	Amount consumed
Corned beef hash	6 oz (170 g)	All
Spinach	2-3 oz (57-85 g)	2 oz (some often left)
Tomato soup	8 fl. oz (0.25 litres)	All
Milk (powdered, reconstituted)	8 fl. oz	All
Crackers	2	All
Butter/peanut butter	½ oz (14 g)	All
Jam/preserves/jelly	½ oz	All
Rice pudding	4 oz (113 g)	All

During none of the four periods of observation did it appear that much food was left over, though canned vegetable is frequently uneaten, as indicated in Table 2. It is possible for some children to get second helpings of the main dish, and of milk, vegetables and crackers, since some surplus is allowed for. On the basis of the observations made, it appears however that there is very little wastage in the Mekoryuk school lunch programme. An analysis of the nutritional properties of the lunches provided is not included in this paper, but it appears that they are consistent with current concepts of nutritional adequacy. Menus are made out for a month at a time, and the items in them are rotated on a weekly basis. Since the school is able to purchase frozen reindeer meat from the Bering Sea Reindeer Project, reindeer stew is a fairly common main dish. Other local food resources do not appear to be used for school lunches since they are not commercially available.

A slice of white, or wheat, bread with processed cheese on it is provided with the soup served on days when the usual "hot" lunch is not prepared. The cheese slices were quite thick on the day in May when the author saw them served. It would appear that such meals are nutritionally equivalent to normal hot lunches.

APPENDIX 2: Infant nutrition

The concern here is with children during their first two years of life. Trends towards formula-feeding in replacement of breast-feeding as discussed by Heller and Scott (1967 p. 75) are very evident on Nunivak Island where only a minority of the women interviewed in this dietary survey admitted that they still breast-fed their children, and then only during the first three to six months, with bottle feeding predominant thereafter. (Two out of eight women said they breast-fed their infants and another said she occasionally did.) The formula given to the infants consists of equal parts of canned evaporated milk and water (most women emphasized that it was boiled water) with one or two tablespoonfuls of sugar or Karo syrup added. The reason given for formula- rather than breast-feeding, or the early transition from breast to bottle, was that the latter was "more convenient", since bottles could be prepared ahead of time. It is interesting to note that two of the women who breast-fed their infants were from outlying villages (in the Yukon — Kuskokwim Delta region). Feeding seems to take place about six times daily, although all of the women said they would feed a baby anytime it appeared to be hungry.

Children up to one year in age receive supplemental vitamin and mineral drops (currently ferrous sulphate of 25 mg/cc strength, and vitamins A, B, C, D, E with fluoride of 30 mg/cc strength). A stronger sodium fluoride (2.21 mg/cc) is also given to mothers of children approaching a year of age. A vitamin-mineral supplement is given to pregnant and lactating mothers, as well as an iron supplement giving them about 900 mg of iron a day. Where these vitamin and mineral supplements were made available to mothers, it was not possible to determine how regularly they were taken by the mother or given to the child(ren). ("They get them most of the time" was the response usually elicited.) Mekoryuk's Health Aid has a baby clinic once a month and mothers are encouraged to bring

their infants to be weighed and measured. Twice a year the Health Aid tests all of the children in Mekoryuk for haemoglobin strength. Vision is examined once a year by a visiting doctor.

APPENDIX 3: Alcohol

In 1967 it would have been possible to state that Mekoryuk had no problem with alcohol, as it was not allowed into the village. By 1970 however it had become clear that enforcement of the ban on alcoholic beverages was a failure, and by 1973 a visitor might not even have been aware that it existed. Drinking has thus become part of Mekoryuk's entry into the modern world. Establishment of a city police force and construction of a jail are direct consequences of it but, as elsewhere, do little to slow down drinking.

Drinking occurs predominantly in the younger and middle aged segment of Mekoryuk's population. In proportionate terms the problem mainly concerns people in their late teens, twenties and early thirties. These are the ones who have been away from Nunivak Island for periods of time, but who have returned to Mekoryuk and need to find some release from the stresses of having to adapt themselves to living there. Drinking might even be considered as one of these adaptations.