

CANCER:

DISEASE OF CIVILIZATION?

by Vilhjalmur Stefansson

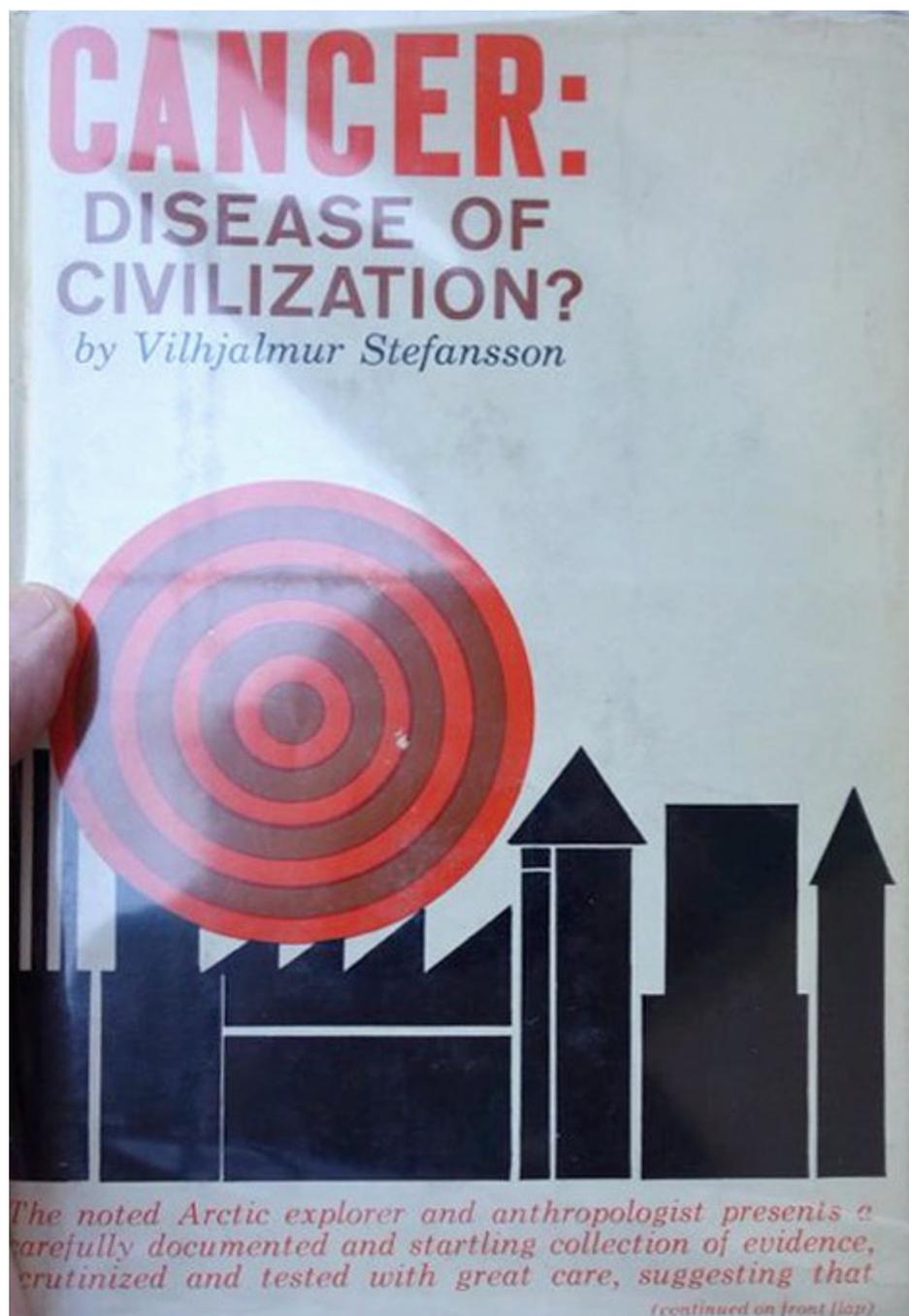


The noted Arctic explorer and anthropologist presents a carefully documented and startling collection of evidence, scrutinized and tested with great care, suggesting that

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Preface

Vilhjalmur Stefansson has had the extraordinary privilege and the rare merit to know intimately

certain segments of the world which will always be strange to most of us. He has had the alertness to note details, to make correlations which would have escaped others. He has been unhampered by professional or even by lay prejudices. And he has a gift for expressing the ideas which his observations have evoked.

The story which he presents in this book is a fascinating one. Here is the sort of thing we call basic research, just as much so as if it were being conducted in the latest of laboratories. Here are the data from a series of experiments which Nature has performed for us — in the Arctic northland, in the tropic forests of Gabon, and in the temperate valley of Hunzaland. She has varied a series of environmental factors yet come up with a like result in the three places, and a result which she has produced, so far as we know, only in those three special combinations of environments, not in any other of her myriads of combinations elsewhere. What have these three in common, that they produce this result, so important to us? Nature will not repeat those experiments. And we will not have another Stefansson to read the data and present them to us. I hope, therefore, that what he has to say will be read carefully and pondered deeply.

I am convinced that this is not the whole story of cancer. I doubt that we will either cure many present cancers or prevent all future ones by reverting to primitive ways of living. Yet we may well cure some, prevent more, and alleviate the suffering from many if we learn to live more effectively within our environment or create environments more suitable to the mechanisms with which heredity has provided us. Stefansson points us a way which we should consider most thoughtfully.

Philip R. White, M.D.

Introduction

It was with the encouragement of the late Dr. John F. Fulton, professor at Yale University School of Medicine, that Dr. Stefansson undertook to organize in the form of a book his anthropological observations on cancer. Professor Fulton had intended to write the preface for this book, but unfortunately did not live long enough to do it. In taking his place, I cannot do better than try to state the reasons that probably enlisted his interest in this study.

Professor Fulton was a historian of medicine, and his knowledge of the past had made clear to him that the pattern of disease in different places has greatly changed in the course of time. History shows that each type of civilization, like each social group and each way of life, has diseases which are peculiar to it. While this fact is well recognized by medical historians, its explanation is a matter of controversy. Is the reason for the variability in incidence of disease to be sought in peculiarities of human constitution, in genetic traits that condition susceptibility and resistance? Or are environmental conditions and living habits the more important factors in determining the types of pathological disorders most common in a given community? The very statement of these questions suggests the almost insuperable difficulties that stand in the way of a decision between the alternatives on the basis of historical records.

Fortunately, the past still survives today in the form of a few populations which have remained almost completely isolated so far, and whose mode of life for this reason differs profoundly from that of modern man. In other words, these primitive peoples constitute control groups for the study of what modern civilization has done to man. However, the time for studying the surviving primitive populations is getting short because everywhere ancient social structures are disappearing or are being grossly altered.

The Eskimos have probably been isolated as long as any primitive people. Indeed, they still had a Stone Age culture a few decades ago, and they therefore provide excellent material for anthropological studies. As everyone knows, Dr. Stefansson lived among them, practically as one of them, before their ways of life had been modified by other human contacts. He thus had the opportunity to observe at first hand what human beings can be like, biologically and socially, when not conditioned by modern technology. In several fascinating books he has described some aspects of life among Stone Age Eskimos. In the present study, he has selected from his broad knowledge the facts that pertain to the occurrence among them of various forms of disease and particularly of cancer.

Not only does Dr. Stefansson give in the present book a detailed account of what he has seen and heard in the Arctic; he also compares his own observations with those reported by anthropologists, physicians, and travelers who have been in contact with primitive people in other parts of the World. From this broad survey there emerges the impression that certain diseases such as dental caries, arteriosclerosis, and cancers are so uncommon among certain primitive people as to remain unnoticed — at least as long as nothing is changed in the ancestral ways of life. Admittedly, the evidence adduced on these points does not satisfy exacting statistical requirements. It would be desirable, for example, to know more exactly the numbers of people that have been observed and the age distribution of the populations; one would wish also that the statements were based on sophisticated medical examinations rather than on casual observations and hearsay. Circumstances did not permit,

of course, such quantitative studies. But incomplete as they are, the findings raise intriguing questions as to the effect of environment and customs on the incidence of disease.

It has long been known that there exist enormous differences in the frequency of different types of cancer in various populations and various places. Recent studies have revealed, for example, a very high incidence of liver and pancreatic tumors among the Bantus in Rhodesia. The dramatic increase in lung tumors in industrialized countries constitutes further evidence of a profound effect of environmental factors on this disease. The findings reported by Dr. Stefansson are therefore compatible with modern knowledge in showing that under certain conditions various types of cancers are extremely rare. These findings will acquire even greater significance if they can be supplemented in two different directions suggested by the present book — on the one hand by more thorough medical surveys to determine whether forms of cancer not readily detectable have been overlooked; on the other hand by follow-up studies to see whether the pattern of disease becomes different as living conditions change.

Dr. Stefansson had the good fortune to observe the Eskimos while they were still in a Stone Age culture, and he has made a most exciting use of this opportunity. He presents an entrancing picture of their life, and of the techniques which have permitted them to function successfully and live happily in their difficult environment. In addition to its sheer interest, this account of primitive life carries a lesson of enormous importance for mankind. It demonstrates that through biological and social adaptations human beings can achieve some sort of fitness to even the most stressful conditions. The Stone Age Eskimos had successfully met the challenges of the Arctic by empirical procedures developed slowly and progressively. In contrast, modern man cannot depend on slow empiricism to achieve fitness to his rapidly changing environment. It is the responsibility of social and medical sciences to analyze the natural and artificial forces which affect his health and happiness, in order to help him develop a rational way of life fitted to the new world he is creating.

René Dubos,
Professor and Member,
Rockefeller Institute

1. The Problem Develops

In the spring of 1906 I resigned a teaching fellowship in anthropology at Harvard University to become field anthropologist of a polar expedition that would reach the North American Arctic from the west.

The Eskimos of the northern edge of our continent, and of the islands to the north of Canada, were to be my project. It seemed that I would get to understand them more easily if I studied these grassland dwellers against the background of their forest neighbors to the south, the Athapaskans. Therefore I would not board the ship of our Anglo-American Polar Expedition, the *Duchess of Bedford*, for an ethnologically profitless sail northward through the Pacific and Bering Strait, and then east along the north coast of Alaska. Instead I would go northwest from Boston by rail through Toronto and Winnipeg to Edmonton. Then, as guest of the Hudson's Bay Company, I would continue northwesterly down the Mackenzie River system through the lands of the Algonquins and the Athapaskans, to reach the Eskimos in the northern edge of the forest at the head of the Mackenzie delta. In an Eskimo boat I would then sail 160 miles farther northwest down a sluggish delta channel and finally another 50 or 60 miles west to where I was to meet our expedition ship, the *Duchess*, at the Herschel Island base of the Yankee whaling fleet, which had been cultivating the Alaskan and western Canadian Arctic since 1889.

On the way north from Edmonton, I was to learn what I could of the changes which had already been wrought by the fur trade and the missions upon the bodies and minds of the Athapaskans. Obviously I would have to depend for this information mostly on what the fur traders and the missionaries themselves would tell me, some of whom would be my traveling companions while others I would meet at the trading posts and mission stations. I would see the country and at least some of its natives.

All this, and whatever else I could pick up, was supposed to prepare me for more effective field work in later years among the Eskimos. The idea seemed so good, and so natural as a co-operative venture for the United States and Canada, that the universities of Harvard and Toronto decided to join in its support. Arrangements were made at Harvard by my chief, Professor Frederic Ward Putnam, and at Toronto by a like-minded Canadian, Professor James Mavor, the universities each paying half the expense and each getting half the resulting ethnological collections, for the Peabody Museum of Harvard and the Royal Ontario Museum of Toronto, respectively.

Before reaching the Arctic, I was to journey through Canada. So it was Toronto that arranged with the Hudson's Bay Company for me to travel with their fur brigades. Toronto it was, also, that arranged with the Church of England for the co-operation of the Anglican missions along our route through the country of the Athapaskans. I gathered that Professor Mavor bespoke similar help from the Roman Catholic missions; but of this I never knew the details — I know merely that the Romans proved as helpful and friendly as the Anglicans.

That these were to prove to be, in part, arrangements for a 54-year anthropological and historical study of cancer in Alaska and northern Canada, did not occur to me. Nor did it occur, I feel sure, to either of the universities. Yet both Mavor and Putnam did consider it one of the purposes of ethnology to record the effect of the white man and his culture upon the bodily as well as the mental health of

those native North Americans into whose lands and homes their universities were sending me.

The elder statesman of science for the Mackenzie River country in 1906 was Roderick Macfarlane, who knew more than any white man then living about the relations of the Mackenzie and Anderson River Eskimos with the Athapaskans to the South of them. The chief commissioner of the Hudson's Bay Company in Winnipeg, Clarence Campbell Chipman, arranged several conferences with Macfarlane; and saw to it that John Anderson, chief trader for the Company in the Mackenzie section, took me under his wing. Anderson looked after me from Winnipeg to Edmonton and kept his eye on me through two months and two thousand miles of steamer, small boat, and portage travel, arranging for all the possible time and sympathy of the missionaries and fur traders along the way, men of Scottish, French, and Indian blood who knew the people and the country, and some of whom had indeed been born there.

My chief interpreter of the forest Indians, and of their country, proved to be the Right Reverend William Day Reeve (1844-1925), who had been missionary to the Athapaskans since 1869 and bishop since 1891, and who traveled with us off and on the whole way. I soon came to share with those who had known him longer their feeling of admiration and affection. But not till my second journey down the Mackenzie, in 1908, did I fully appreciate my good fortune that it was Bishop Reeve who introduced me to the health and welfare problems of the Athapaskans.

Fresh from college, Reeve was twenty-five when the Church of England stationed him at Fort Simpson, metropolis of the Hudson's Bay Company's vast northern fur empire. The post had a well-chosen library; and its archives contained manuscript journals of the early explorers of the northern third of the continent, for many of them had been in the service of the fur trade and nearly all had some connection with the Great Company. There was also a museum of the natural history and ethnology of the Canadian North. From Simpson the fur trade was governed not only northward down along the Mackenzie to the Arctic Sea but also westward across the Rockies into British Columbia and the Yukon.

Reeve had spent one or more winters at places other than Simpson. While yet a missionary, he had been stationed a year at Fort Rae, on that northward arm of Great Slave Lake which stretches toward Great Bear Lake; and he had spent some years near the farmlands of the south, at Fort Chipewyan on the west end of Lake Athabaska. From this experience, and from talking with missionaries and traders who everywhere kept going and coming, as well as from his reading at the Simpson library, the bishop had acquired that sure grasp of the nature and history of the Canadian North upon which I have since leaned so heavily. Between my first and second journeys down the Mackenzie, he had been elevated to the bishopric of Toronto; but the Mackenzie held his first and permanent affection. When I last saw him, at Toronto in 1920, he was still keeping his finger upon the pulse of the North.

In 1906 the bishop was with us from May until July as we floated with the current northwestward from Edmonton and Athabaska Landing toward the Arctic Sea, sometimes drifting at three miles an hour in scows and then puffing along a bit faster on wood-burning steamers or walking across portages. This was ideal travel for conversing, especially for those who were eager to listen and learn. To us the bishop discoursed of the land we were passing through and of the Indians we saw. Upon occasion we questioned him, often about former and present health conditions; for the men and women we saw were in some cases pathetic with disease.

Before Europeans came, Bishop Reeve thought, his Athapaskans must have been among the healthiest peoples in the world. But many of them died young nevertheless. At childbirth the mortality was high, especially for babies but also for mothers. Accidents were many in childhood and youth, indeed throughout life. Though famines came seldom, the wiping out of small groups by starvation was frequent. Murders occurred, but not as often as among whites. Women who survived the childbirth period, and their male contemporaries, would more likely die from old age than from disease.

The problem of whether old age descended upon Indians sooner or later than upon whites, the bishop thought, could be discussed only with regard to probabilities, since undisputed facts were hard to come by. He had read in the books of some explorers, and in some Hudson's Bay Company reports from early traders, that old age was supposed to afflict the native prematurely. But himself he was unable to see how those writers could have found this out, even if their interpreters were of the best. For the very idea of counting years, to keep track of a person's age, was foreign to native thinking and had been brought into the Athapaska country by these same Europeans. The only fact that a Mackenzie River Indian could know about anybody's age, and the only thing he could have told anybody, was which of his neighbors were older than others.

By the time he discoursed with us in 1906, Bishop Reeve had been pondering matters of northern Canadian native health and longevity for thirty-seven years, starting in 1869. During the scores of hours in which the bishop shared his knowledge and thinking with us, I gradually came to understand how he classified the diseases and derangements which he believed were derived from Europe and which he chiefly blamed for changing the Athapaskans from healthy to sickly, and for reducing the population of the northern third of our continent from several millions to fewer than one hundred thousand. His grouping of these presumed imports seemed to be:

1. Cataclysmic germ afflictions that swept away the robust and the weak indiscriminately.
2. Insidious germ infections to which the strong were resistant.
3. Sickesses which probably were not due to a germ freshly introduced by Europeans but which likely were caused by a deleterious way of life introduced from Europe.

Bishop Reeve characterized the three groups as follows:

Cataclysmic germ diseases, like measles, killed at their first onslaught from 50 to 90 per cent of even the strongest. Death came in one, two, or several days. Years later, the second measles epidemic would kill perhaps 10 or 20 per cent, the next after that proving fatal to only a few. Thus, through brutal weeding out by recurrent epidemics, the few surviving Indians, and their descendants, became nearly as immune to measles as if they had been whites.

Insidious germ diseases, like tuberculosis, would take a relatively small toll at first, seeming to grow worse progressively as the new generations came along. The bishop considered that this increasing mortality might perhaps be due to a weakening of general health under the influence of maladies such as he listed under his final heading:

Diseases of Europeanization. These included a dozen maladies such as cancer, rickets, scurvy, and

tooth decay. Their recent appearance among the Athapaskans was charged by the bishop to the introduction of such foods as bread and sugar, and to such new food-handling methods as the preservation of meats with salt and the overcooking of fresh foods.

Since there are several chapters to come that deal with the experiences of frontier doctors in search of cancer, and other diseases of this group - since, indeed, cancer is the central topic of this book — I shall now dispose first, and shortly, of the bishop's "cataclysmic" and "insidious" classifications. However, what Bishop Reeve told of measles, the very deadliest of his cataclysmic group, is much like what I shall have to record from Alaska and northwestern arctic Canada later on; so I shall postpone measles, too and start with what may have been the second worst plague, smallpox. Instead of reconstructing what the bishop related, I shall use a classic which has the advantage that it can be checked in any big library. I quote Joseph Burr Tyrrell's edition of *David Thompson's Narrative* (Toronto: Champlain Society, 1916), beginning on page 321.

In a note Tyrrell says that the "undated diary entry" he cites must be from 1781, "for it was in the late summer and autumn of that year that the frightful disease swept across the plains and reached the Saskatchewan." Thompson's party had been down east to York Factory on Hudson Bay and were on their way back west to their own station on the Saskatchewan:

"... we proceeded about 150 miles up the river of the Eagle Hills, where we saw the first camp ... when we came to them, to our surprise they had marks of the small pox ... none of us had the least idea of the desolation this dreadful disease had done, until we went up the bank to the camp and looked into the tents, in many of which they were all dead, and the stench was horrid. Those that remained had pitched their tents about 200 yards from them and were too weak to move away entirely, which they soon intended to do; they were in such a state of despair and despondence that they could hardly converse with us ... From what we could learn, three-fifths had died under this disease ... They informed us that so far as they knew all the Indians were in the same dreadful state ..."

What Bishop Reeve told in relation to Athapaskan health and welfare, as affected by infectious diseases which he believed to be of European origin, has been summarized in the official *Indians of Canada* by Dr. Diamond Jenness (Ottawa, 1932), beginning on page 163:

"The most ambitious [Canadian] native never dreamed of creating a tyranny or of subverting the established political constitution for his own advantage. So Indian tribes never knew those internal revolts that distracted the city states of ancient Greece and rendered our Saxon forefathers an easy prey to Danish and Norman invaders.

"Nor did they suffer from those virulent diseases, smallpox and measles, that decimated their ranks in historical times ... Skeletons from prehistoric graves seem to indicate a very healthy population, although the weaklings who died in infancy are probably very imperfectly represented in these remains."

On page 251 Dr. Jenness is speaking of how things were a few centuries later. "Many tribes acquiesced quietly in the invasion of their territories; others ... offered strong opposition. Whether they resisted or submitted, all alike paid the same high price for their contact with civilization, some

even before they had actually encountered Europeans. The first plague that afflicted them was smallpox, which decimated them periodically from the early seventeenth century until the second half of the nineteenth. Nearly all the early writers describe its ravages ...

“A medical historian states that ‘the path of smallpox, from the time that it was introduced among the Montagnais in eastern Canada until it reached the most westerly tribes both in Canada and in the United States, may be followed only too easily. It left behind it a broad and well-blazed trail. Appearing in 1635 among the Montagnais, who dwelt near Tadoussac on the lower St. Lawrence, it spread with great rapidity north and south, east and west ... By the year 1700 smallpox had spread over half the continent, leaving a trail of death and devastation. ... The disease kept pace with, and at times outstripped, the progress of the white man ... it played no mean part in the reduction to a mere handful of the once numerous tribes.’”

After quoting this from J. J. Hagerty, *Four Centuries of Medical History in Canada*, Dr. Jenness continues:

“Smallpox was the deadliest but by no means the only plague that afflicted the aborigines. Typhus carried off one-third of the Micmac in Acadia in 1746, and the winter of 1902-3 destroyed the entire Eskimo population of Southampton Island in Hudson Bay. ... Pulmonary afflictions, especially tuberculosis, attacked the natives at an early date and ever since have caused a high mortality. ...

“These diseases, if known at all in America before its discovery by Europeans, were certainly very rare, and they exacted a heavier toll because the natives had never developed the slightest immunity.”

As said, Bishop Reeve considered that Europeans had transmitted to the Indians not merely some deadly germs but also a debilitating way of life; and he thought we were making some of the germs even deadlier, for instance, those of tuberculosis, through our ever more persistent introduction of less wholesome foods and more harmful cooking methods — and through what he considered our even deadlier houses.

The bishop told, with partly amused but largely serious admiration, about an ex-prize-fighter, Marsh, now his missionary at Hay River on Great Slave Lake. Marsh, he said, used muscular Christianity, if persuasion would not serve, to get Indians to abandon their white-man-style cabins for native wigwams, sometimes literally dragging families out and throwing their gear into the snow after them — thus trying to stop them from inoculating each other with tuberculosis as they sat huddled in front of a stove, “baking bannock in a hovel when they ought to be roasting moose meat against a camp fire out in the woods.”

Bishop Reeve seemed a little doubtful about the heroic Marsh technique when it was used against a germ disease like tuberculosis. But against another group of ills he felt sure the native life was a panacea, preventing those derangements which he believed to be caused by eating the wrong foods or by not eating the right ones. This baker’s dozen or so of diseases he thought nutritional. I consider his full list farther on, along with some additions contributed by Alaskan and Canadian medical missionaries. I shall now select three from this lot, because in 1906 everybody along the Mackenzie River system was talking about them, as part of what they had to say about the Klondike Gold Rush.

They had a good deal to say; for in 1906 the Yukon-Alaska gold stampede, the rush of '98, was a vivid memory of a short eight years before. There were even remnants from the horde still around, picturesque, revolver-toting incompetents who had poured north through Edmonton, the swarm thinning gradually down river, many of them complaining loudly of toothache and some of them dying quietly of scurvy. The bishop summed up this part of the story as follows:

Before the ninety-eighters came, everybody along the Slave and Mackenzie rivers had at least heard of both toothache and scurvy, and some knew one or both from their own experience. As to scurvy, it was well known that Company people did have it at the ocean ports on Hudson Bay, where victuals were cooked European style and where most of the food came from Europe by ship. At these seaports the Indian wives of white men got scurvy nearly as often as the white wives of others. But at the inland trading posts, where flesh foods alone were to be had, and where they were not overcooked, neither whites nor their Indian affiliates ever had scurvy. The like was the case with tooth decay — nobody suffered tooth decay on the Mackenzie except those who had brought decay with them in their mouths from some such place as Hudson Bay or Scotland.

It was all a matter, the bishop thought, of what food you ate and of how it was stored and cooked. Scurvy cured itself when you left the Bay for the interior. Decayed teeth were not exactly cured by the all-flesh diets of the inland posts, but the tooth cavities ceased growing larger.

This was what everyone formerly believed on the Mackenzie about toothache and scurvy. Many of the Athapaskans had never seen an active case of either; but with the gold rush a lot of people came into the fur lands who not merely had rotten teeth already but who also brought with them quantities of the sort of food that would help continue the decay processes and, as the event showed, would also produce in the Mackenzie District the sort of scurvy they had heard of as suffered by the Company's people on Hudson Bay.

All this was conversational stock in trade on the river in 1906; and, to a slightly lesser extent, also during my second journey, in 1908. There were humorous tales of amateur dentistry against toothache, and far from humorous ones of scurvy through which teeth came loose and finally dropped out, as death approached.

Speaking of the Klondikers, everybody was saying what the bishop had been the first to tell me — that, so far as scurvy was concerned, those tenderfeet were best off who brought the least food with them. For the Athapaskans would not see them die of hunger; and they fed the tenderfeet on medium-cooked fresh fish and game, to the general benefit of their health and the complete avoidance of scurvy.

No one, that I can remember, was seriously worried about cancer; nor was I myself particularly interested. As intimated, I now remember about malignant disease from my first journey chiefly that Bishop Reeve thought it to belong to a group of ill's which had behind them nutritional issues. But I do remember noticing more talk of cancer as we approached the Eskimo country, to the effect that the New England whalers, who wintered among the Eskimos east and west of the Mackenzie delta, could find no more cancer among them than missionaries and fur traders had been able to find among the Athapaskans — meaning none. The bishop said he had discussed this with other missionaries who knew more than he did about the Eskimos; I think he mentioned the bishops Bompas and Stringer, and

that he had sent messages through Stringer to the whaling captains bolstering their seacoast results with his own from the interior.

What I especially remember is that when I saw the bishop at Toronto fourteen years later, in 1920, he told me he had long been in the habit of saying that he blamed diet for cancer because he knew of civilized Indians who had been victims but of none among the uncivilized. As I think back, it seems to me he spoke of this as if it were hearsay knowledge; and indeed it may well have been from books. For at least two of the classics of northern exploration, both of which are nearly sure to have been in the Hudson's Bay Company's famous Simpson Library, speak of cancer as found among Indians married to or working for Europeans.

During the early summer of 1833, the future Admiral Sir George Back, after whom Back's River in arctic Canada has since been named, was on his way from Britain to discover it. With his later equally famous surgeon-naturalist companion, Dr. Richard King, Back traversed the St. Lawrence River and followed the north shore of Lake Superior westward before crossing northwest to the Mackenzie system at Fort Chipewyan, both doctor and captain interested in what they could learn about disease. Most pertinent to our study of frontier beliefs related to cancer, is an extract which begins on page 187 of Back's *Narrative of the Arctic Land Expedition* (London, 1836):

“While at Chipewyan, Mr. King had performed a successful operation on a woman's upper lip, which was in a shocking state from cancer, brought on, as he thought, from the inveterate habit of smoking, so common among the half-breeds. He had met with two or three cases of it before; one, at Fort William, was incurable, and very loathsome. His presence was hailed with delight at every post beyond Jack River, either by the natives or those who resided with them; and it surprised me to learn how much disease has spread through this part of the country.”

Back's saying that it surprised him “to learn how much disease had spread through this part of the country” is, of course, confirmatory of the general belief of the time, that in their native state the Indians of northern Canada were healthy; and that most sicknesses which he found among them were of European introduction.

Following up Back, let us turn to his colleague Richard King's *Narrative of a Journey to the Shores of the Arctic Ocean* in 1833-35 ... (2 vols., London, 1836). We fail to learn anything pertinent about cancer on Lake Superior; but the expected Lake Athabaska reference turns up on page 108 of the first volume:

“... I proceeded (from Fort Chipewyan) to the woods with my gun and vasculum in search of specimens of botany and natural history; in which employment, and in administering relief to the sick people at the fort, my time was entirely engaged. Amongst those who daily came for medical advice was a half-breed woman with her upper lip in a highly cancerous state. It was a case wherein a surgical operation was absolutely necessary, to which the poor woman readily submitted. She bore it with much fortitude, fully justifying the character imputed to these people.”

As I said, material from such book sources as Captain Back's and Dr. King's, the bishop and I may or may not have discussed on the upper Mackenzie; on the lower Mackenzie the discussions, upon this and other topics, tended to shift toward the Eskimos whom we were approaching. After our convoy of

fur traders and missionaries passed Forts Norman and Good Hope on the 1906 journey I began to hear it being said around me that Eskimos resembled Athapaskans in not having tooth decay, scurvy, or cancer.

It was probably at the Arctic Red River (where on July 20, 1906, I first saw an Eskimo) that I first heard of Captain Leavitt, who, I found later, was known on the lower Mackenzie, as well as on the shores of the western Canadian Arctic, as “the man who started the search for cancer.” Or perhaps I first heard of Leavitt the next day, July 21, at Fort McPherson, where I met John Firth, Hudson's Bay Company factor, destined to be my friend until his death two decades later. In later years we talked a great deal of Leavitt, whom Firth admired, and whose search for cancer in northeastern Siberia, the Aleutian Islands, Alaska, and northwestern Canada, led a half century later to the writing of this book.

2. Captain Leavitt's Search For Cancer Among The Eskimos

On August 9, 1906, we reached the whalers' harbor of Herschel Island, just west of the delta of the Mackenzie and in Canadian territory, about 40 miles east of the northeast corner of Alaska. Several New England ships were there, but not at the moment the one that I had been hearing most about, Captain George B. Leavitt's steam whaler *Narwhal*.

Our own expected *Duchess of Bedford* was not there either. But in her place, unexpected by me, was another polar expedition ship, the *Gjoa*, and her later very famous commander, Roald Amundsen. He and the *Gjoa* were just about to complete the first voyage from the Atlantic to the Pacific around the north of our continent, by the glamorous Northwest Passage. Amundsen invited me to be his guest aboard the *Gjoa*, against the momentarily expected arrival of our *Duchess*.

Aboard with Amundsen I heard from all and sundry, but especially from the second-in-command, the Danish naval lieutenant Godfred Hansen, about the relatively admirable results of Danish care for Eskimos of Greenland. I also heard much of the allegedly deplorable results of our hit-and-miss system, or lack of system at that time, in the civilized parts of Alaska and Canada; and about the healthy, happy, and admirable, not yet civilized Eskimos whom the *Gjoa* had known for two years in and around King William Island. Better than anything I could write up, from memory and records, is to quote on this point from Amundsen's two-volume *The Northwest Passage* (London and New York, 1908). The following excerpt is from his two-chapter section "The Inhabitants of the Magnetic North Pole":

"During the three year voyage of the *Gjoa* we came in contact with ten different Eskimo tribes in all, and we had good opportunities of observing the influence of civilization upon them, as we were able to compare those Eskimos who had come in contact with civilization with those who had not. And I must state it as my firm conviction that the latter, the Eskimos living absolutely isolated from civilization of any kind, are undoubtedly the happiest, healthiest, most honourable and most contented among them ..."

Here and there *The Northwest Passage* gives instances of modern physical decay, and of the tragic effect of Europeanization on health and longevity. On page 142 of Vol. II Amundsen speaks of the people of the Mackenzie delta, a region in which I was to live Eskimo style off and on during the six years following the *Gjoa*'s voyage. Says Amundsen: "... civilization has had its corrupting influence upon them, so that instead of several hundred families their number was reduced to a handful."

In Amundsen's book, the last sentence of the final chapter on the people of King William Island is set off by him as a paragraph:

"My sincerest wish for our friends the Nechilli Eskimos is, that civilization may *never* reach them."

After the *Gjoa* had been my hostess for a week, she sailed away to complete the Northwest Passage. Her going left me sad, because of Amundsen's and especially Hansen's confirmation of my fear that I had come north to study a dying, though an admirable, race. The feeling wore off. The Eskimos I met on Herschel Island were the happiest-seeming people of my experience up to then. Clearly they

worried no more over becoming extinct as a race than children at play, when they are seven, worry because they may die by the time they are in their seventies.

But I felt I had secured from the *Gjoa* a pertinent opinion, an interesting though not a decisive vote, on whether civilization is good for the Eskimos.

As summer wore on, the whaling ships, singly or by twos or threes, dropped anchor for a night or two in our Herschel Island harbor and then sailed west, homeward bound for San Francisco. No ship was expected from the west except our *Duchess*, and she did not come. According to my book, *Hunters of the Great North*, which is the narrative of my first northern year “August the 28th the *Charles Hanson* and the *Olga* set sail, thus cutting off from the world for a year the little arctic colony of Herschel Island.”

On Herschel were Northwest Mounted Police — they were not yet called “Canadian” or “Royal Canadian.” There was a Church of England mission and a Hudson's Bay Company trading post. The island was white man dominated, and I had come to study Eskimos; so I moved east, first 60 miles to Shingle Point and later more than another 100 miles, beyond the Mackenzie delta. Of this I have told a connected story in the above-mentioned *Hunters* book; here I shall relate only such things as seem to me to have a fairly direct bearing on the search for cancer.

In January 1907 I heard through Eskimos that the *Duchess*, with all but me of the staff of our expedition, had been held up by ice after rounding Point Barrow from the west, and was in the shelter of Flaxman Island, about halfway from Barrow to Herschel. With a single Eskimo as mentor and companion, and a small team of dogs, I reached the *Duchess* on April 17, 1907, to find the joint commanders, Leffingwell and Mikkelsen, away searching for possible new land by sledging over the unexplored sea northward from Alaska.

In their absence, the Flaxman Island base of the Anglo-American Polar Expedition was commanded by Dr. George Plummer Howe, the expedition's surgeon. It turned out that he and I had been contemporaries at Harvard, though we had never met — not strange, for the medical school is in Boston, and I had been in the divinity school and then in the graduate school, both of which are in Cambridge. He was A.B. 1900 and M.D. 1904.

Though a medical man by training, Dr. Howe proved to be an anthropologist at heart. What he told me included his having heard in the summer of 1906, almost as soon as the *Duchess* reached Alaska waters, that “Eskimos never have cancer,” and that Captain Leavitt was credited with originating the local search on which this view rested. One of the first to tell Howe this had been the surgeon on the United States revenue cutter *Thetis*, whose name I neglected to record; but more extensive detail had been given Howe by the head of the Presbyterian medical mission at Point Barrow, Dr. Horatio Richmond Marsh, a native of Illinois.

In talking with Dr. Howe, both the surgeon of the *Thetis* and the medical missionary at Barrow had agreed on several points, among these that in northern Alaska Leavitt had originated the local quest; that he had been indefatigable in urging government doctors, medical missionaries, expedition surgeons, everybody, to look for malignant disease; that many of these searchers, including Howe's informants, had expected to find cancer; but that all of those who remained in the Alaskan Arctic had

been convinced eventually, that cancer was not to be found among Eskimos who still lived native style.

Dr. Howe agreed with his two main informants on the importance of an additional point which both had emphasized: that Leavitt knew the names and personalities of hundreds of sick people; and that by 1906 he had known many of these for more than two decades; so that any external cancers, if not recognized early, must have had by then plenty of time in which to develop and to become easily recognizable, if not fatal.

Dr. Marsh had himself been in charge of the Presbyterian medical mission at Barrow since 1897, thus nearly a decade; and he too knew hundreds of invalids among the thousands of persons who came under his observation. External cancers, Howe felt, could not possibly exist in the inspected region for decades without being recognized or without resulting in deaths.

So we agreed, Howe and I, that we saw no holes in the curtain of testimony. And we both published our agreement. Howe's was the earlier to be printed, in "Medical Notes on Northern Alaska," which he contributed as an appendix to the narrative of the expedition, Captain Ejnar Mikkelsen's *Conquering the Arctic Ice* (London and Philadelphia, 1909):

"It has been said that cancer does not exist among the Eskimos. So far as I could find out, this is true ..."

My like summary, of what Howe and I both had been told, was printed five years later. For when I was about to leave on my third polar expedition, the one of 1913-18, I gave permission to Dr. Clark Wissler and Miss Bella Weitzner of the Department of Anthropology of the American Museum to go through all my diaries and notes of the two previous expeditions and to publish anything they found there which they might care to extract. The result appeared as *Anthropological Papers of the American Museum of Natural History* (New York, 1914). The cancer reference was taken by Miss Weitzner from my diary entry at Flaxman Island for April 13, 1907, the second day of Howe's conference and mine, and is on the museum's page 186: "Cancer is said not to be found among the Eskimos."

When Howe used the wording "It has been said that cancer does not exist among the Eskimos," he was reporting the opinion of northwestern and northern Alaska as he found it in 1906-7. When I phrased it that "Cancer is said not to be found among the Eskimos," I was reporting for the same years on the belief as I had found it a little farther east, on the lower Mackenzie and generally in the western Canadian Arctic. Both Howe and I had in mind our talks with each other and our having compared notes on what we had been told by fur traders, whalers, government doctors, and missionaries.

With the exception of the first few remarks of like nature which I heard on the lower Mackenzie, these beliefs on malignant disease were specifically said by many to be conclusions from a search first begun by Captain Leavitt and later carried forward also by many whom he had enlisted, whether by urging or through example. So now we tell more of George B. Leavitt, a whaling captain from Portland, Maine.

As Leavitt himself told it to me, his search for cancer among the natives of northeastern Siberia,

Alaska, and northwestern Canada was basically connected with New England thrift.

There was, it seems, a federal law that if a ship had a crew of fifty, or over, she had to carry a fully licensed doctor; so the owners saw to it that no whaler bound for the Alaska-Canada Arctic had a crew of more than forty-nine. But the feeling was that every whaling ship should have a stopgap doctor; so a high officer, captain or mate, was usually a passable amateur in medicine, good enough to look after a sick man till the next chance to get him to a hospital. This meant that an ambitious young seaman would have better chances of promotion to mate, and eventually to captain, if he showed himself good at lancing boils, setting broken limbs, and doing small amputations.

For this sort of advancement young Leavitt had a better chance than most, for he had a half-brother who was a doctor able to give him first-aid training. As others in the whaling fleet told me the story, Leavitt was in any case a natural for promotion, with charm, health, and muscular prowess; but his own version had it that surgery was his main avenue to promotion. This view is, to an extent, confirmed by the first story of him which we have found in print.

Leavitt received his first notable publicity in a book which, although a government report, was a best seller in at least New England and California, indeed wherever the western Yankee whaling fleet was known. For in 1897-98 the fleet was the victim of a "heroic" rescue, the tale of which is told in *The Cruise of the U.S. Revenue Cutter Bear ... for the Relief of the Whalers in the Arctic Ocean ...* (Washington, D.C.: Government Printing Office, 1899). This volume contains 12 pages by the *Bear's* doctor: "Report of Surg. S. J. Call, R. C. S." Here Dr. Call tells about the amateur surgery performed on members of the whaling fleet as a result of the economy dodge of every captain's being his own ship's doctor. The section of Dr. Call's report that is most pertinent here begins on page 122:

"Before closing this interesting subject, I must speak of some of the amputations by one or two of the captains of the whaling fleet. Their fearlessness and the results are sometimes remarkable, and would call forth the praise of our most expert operators. I mention in this connection Captain George B. Leavitt, who lately commanded the steam whaler *Newport*."

Dr. Call had asked Captain Leavitt for a memorandum, and quotes from it:

"I am glad," says Leavitt in the memo he gave Call, "that I have the dates of most of the amputations since the ships began to winter at Herschel Island [1889]. This first was on a man belonging to the *Mary D. Hume*, in March 1891 ... Captain Tilton bossing the job ... [Here follow details of this operation and of many others.] From December 28, 1895, all surgical work was done by me, with Captains Bodfish, Cook and McKenna assisting ..."

Reports of this sort, but in greater detail, were among the first things I heard about Leavitt when I began to be guest of the Mounted Police at their barracks on Herschel Island, after Amundsen left. The police said that whenever anybody was seriously ill on any ship of the fleet, or anywhere ashore, they looked for a chance to get in touch with Leavitt's ship, which in my time was the *Narwhal*, to have him prescribe medicines or other treatment and perform surgery if that seemed required.

The aforementioned idea, of using surgical skill as a means toward promotion in the whaling fleet, was Leavitt's own and that of his half-brother, Dr. Charles S. Knight, who, the only time I met him, in

the late autumn of 1907, was living at 316 Woodford Street, Woodford Station, Portland, Maine.

As part of the coaching for the coveted promotion, Dr. Knight had impressed upon his sailor brother, in relation to primitive peoples, that two groups of diseases were of special interest to doctors, those more deadly to natives than to whites, and those less deadly. This second group included some troubles to which the natives seemed wholly immune, either for racial or environmental reasons. In this group (it seemed to me from Leavitt's account) Knight had listed pretty much the same troubles which Bishop Reeve had told me were rare or nonexistent among the Mackenzie River Athapaskans, and one of them was cancer.

Leavitt's first good chance to carry out his brother's suggested scouting among the Eskimos, for rare or missing diseases, came in the fall of 1884 when he was one of a group selected by owners of New England whaling ships to look after a project of theirs to develop in northwestern Alaska the fleet's own local supply of fuel for steaming and cooking. Outcroppings of promising coal had been found on the north coast, just east of Bering Strait near Cape Lisburne. There were in those years a thousand Eskimos living between Point Hope and Point Barrow; all of these, and some more from farther south in Kotzebue Sound, Leavitt had a chance to see during the summers of 1884 and 1885, and during the winter between. So the amateur student of health had a good deal to work on, even during his first year. After 1889 the ships began to winter farther east, around the Mackenzie delta; and the chances of seeing Eskimos ran to 10,000 a year and some years no doubt 20,000, counting those of the Aleutian Islands and northeastern Siberia.

During the Herschel Island winter, when I was occasionally Leavitt's guest, he kept the officers' mess as interested as he did me with stories which as often as not had some medical or health angle; for after all he was the fleet's foremost surgeon. He brought out that in his early scouting for maladies he had been, among the Eskimos of the coastal prairie, as I had been, among the Athapaskans of the Mackenzie woodlands, less interested at first in the absence of cancer than he was in not finding a decayed tooth or a symptom of scurvy. Everybody is interested in toothache; and in those days every sailor worried over scurvy.

But, said Leavitt, the whaling voyages were seldom longer than three years; and when he returned home to Maine his brother kept getting more and more searching in his questions about how sure the captain was that the Eskimos really never showed signs of cancer; for Dr. Knight's interest was swinging in the direction of malignant disease — an amateur interest, for he was a gynecologist.

At San Francisco, going and coming, Leavitt picked up all the acquaintances he could among doctors. After Dr. Call's praise of Leavitt's surgical skill, in a book that all San Francisco was then reading, the young captain found himself invited to clinics and to homes of doctors, especially surgeons. These chances he used in part to discuss malignant disease, its early detection and correct identification. He used every chance he had to see early and obscure cases.

Leavitt's activity in scouting for cancer would seem to have been at its peak two or three years after Dr. Call's publicizing made him a California celebrity. For he told me in 1907 that the last three or four years before we talked he had pretty much stopped looking for cases himself, or questioning other frontier doctors, because he was so sure by then that, except among civilized Eskimos, no native cancers would be found in the Arctic. Thereafter, I gathered, he used his diagnostic skill mainly to

discover early malignancies among the personnel of the fleet, or ashore among whites, Chinese, Negroes. On such malignancy cases as he found, he seldom operated. Instead he used his friendships with other whaling captains, with miners, traders, and such, to get the suspected case with minimum delay, to a good big-city doctor, usually in San Francisco. Leavitt believed himself to have saved a few lives in this way.

It is my hope that from the reading of this book will spring an interest in consulting people who may still be living, among those who knew Leavitt. Therefore, I want to mention the firm of H. Liebes & Company, Post Street, San Francisco, several of whose members and staff knew Leavitt and who should be able to refer to others who knew him. He was well known in the Hawaiian Islands too; the last I knew he was manager of railway there.

Four things seem more important than others to discuss concerning Leavitt and the northern cancer search: (1) how many and what sort of people did he influence to join his quest; (2) how many non-natives did he see per year, among whom he occasionally found malignancy cases; (3) how many natives were seen by Leavitt, and by those whom he alerted, among whom no malignancy was discovered; and (4) what sorts of opportunities did such frontier investigators have for discovering malignancies?

1. Most important of those whom Leavitt egged on to a persistent cancer search was a group that probably did not need egging, the medical missionaries and their nursing staffs. Of those whom Leavitt knew best, and whom I also knew later, those connected with the Presbyterian medical mission to the Point Barrow district were foremost. Later I shall quote two of the medical heads of this mission, who were there through the years 1897-1912 and 1921-36, and also two of their nurses.

The great importance of the missionary evidence is that through decades they knew thousands of persons by name and by intimate history, so that a failure to detect a malignancy in an early stage would of necessity have been revealed through the progress of the trouble. Of lesser but not of negligible importance were the doctors of government ships and surgeons of exploring expeditions. Certainly many of them had only passing glimpses of native strangers; but at least if there had been conspicuous malignancies — such as, for instance, advanced cases of breast cancer in women — they would have been noticed.

2. The number of non-natives passing under review is important; for it was the occasional finding of malignancies among them that kept the investigators, like Leavitt himself, on their toes. We should have in mind, then, that the average number of whale men per ship was probably around twenty-five, since forty-nine was the top number and crews seldom numbered fewer than fifteen. Most of these were white sailors, but there were Massachusetts Indians, New England “Portugees,” Chinese, Negroes, etc. The ships which wintered at Herschel Island were seldom fewer than five in any one year and there probably were never more than sixteen, even counting those that wintered at Langton Bay and the Baillie Islands. The time span, following the inception of the Leavitt search, was from 1885 to 1907. The non-natives, who were a sort of control on the natives, numbered, then, about 250 a year for twenty-two years.

3. The natives, among whom no malignancies were detected during the same period, were about twice as numerous before the measles epidemic of 1900 as they were thereafter. Before the epidemic

there were under Leavitt's view perhaps 50,000 natives each year for fifteen years. After 1900 there were, say, 25,000 a year for six years.

4. As for the opportunities which whaling captains, medical missionaries, and other frontier doctors had for detecting malignancies, two main points should be remembered; first, that the Eskimos always had great faith in doctors, their own and later the Europeans', and consulted them on all occasions about real, fancied, pretended, or anticipated troubles. Second, and no less significant, was the native Eskimo practice, not discontinued till after 1910, for both men and women to sit around, in the winter houses, naked from the waist up and from the knees down, sometimes with only breechclouts (as shown, for instance, in John Murdoch's illustrations of his 1881-83 Point Barrow report to the Smithsonian Institution). All whites, and especially missionaries visited around freely under these conditions; and if they were scouting for cancer, as Captain Leavitt and Dr. Marsh were always doing, external evidence of it would have been readily noticed.

To sum up: the non-natives, among whom cancer was occasionally recognized, were much fewer than the natives, among whom cancers were never detected. Among the natives, the chance for detection of a malignancy was better than among the non-natives; for Eskimos liked to consult doctors and they went around naked, especially in winter; but sailors try to avoid doctors, and in any case are clothed usually. Those who think of cancer as chiefly an affliction of middle and old age should note that longevity was high among the natives in the early "cancer free" time, almost certainly as high as among the non-natives. (For a general discussion of Eskimo longevity, before and after the Europeanization of their way of life, see Chapter 14.)

3. Remote Origins Of The Frontier Search For Cancer

So far, this story has been told from memory, from diaries kept in the field, from other documents, and from the cogitation of fifty-four years. I have told of northern Indians, chiefly Athapaskans and Eskimos, and of Europeans who dealt with them.

I have steadily wanted to retain, as my two heroes, the Church of England missionary Bishop William Reeve and the New England whaling captain George Leavitt. And I have wanted the Canadian story to begin in 1869, when Reeve got to his post at Fort Simpson on the middle Mackenzie, and the Alaskan story in 1884 when Leavitt reached the coal mine on the western north coast at Cape Lisburne.

I have not, however, been able to dismiss my curiosity over the detail that in Leavitt's case the idea of looking for cancer among the Eskimos had come from his half-brother, who was a doctor and who disclaimed being an originator, saying instead that he knew from medical journals the eagerness of the profession for information from travelers on whether malignant disease did or did not exist among primitive peoples. I found myself hankering more and more to find out who in the medical journals which Dr. Knight had a chance to read was the originator of the idea that cancer is a disease of civilization. I think I have found out:

As an anthropologist who dabbles in nutrition, I have acquired a lot of friends who are doctors, some of them cancer specialists. I asked one of these to recommend some book as a good world survey of theories and facts related to cancer. I learned that probably the best even now available was published in 1915 at Newark, New Jersey, by the Prudential Insurance Company of America. This I secured and found it to be an 846-page compendium, *The Mortality from Cancer Throughout the World*, by Frederick L. Hoffman, chairman of the committee on statistics of the American Society for the Control of Cancer. On page 23 I discovered a promising clue, a reference to "M. Tanchou's idea that mortality from cancer is in direct ratio to the intensity of human civilization ..."

"M. Tanchou's idea" was clearly Bishop Reeve's idea, and Leavitt's. Then who was Tanchou? First I looked in the index of the Hoffman book and found "Tanchou, cancer theory of, 23." This, of course, merely referred to the passage I had been reading. Next I looked in Hoffman's more recent and equally huge book, *Cancer and Diet* (Baltimore, 1937), since the inference seemed to be that Tanchou believed in a nutritional cause for malignant disease; but I drew a blank in its index and in its bibliography as well. Then I consulted several of the standard encyclopedias but found nothing.

Baker Library of Dartmouth College, where I do my writing, is good at ferreting out difficult sources. I just passed a note along and waited. But the wait lengthened, and finally came the bothered complaint: We cannot seem to get started. What nationality was this man? Presumably French, for that is the usual inference when you use "M." instead of "Mr." However, our medical library was going ahead and might turn up something.

With a habit of sponging on my friends, I thought of one who was Sterling Professor of the History of Medicine at Yale and wrote to Dr. John B. Fulton. My letter found him on vacation; but I heard from Miss Madeline Stanton, Librarian of Historical Collections. On June 2, 1957, Miss Stanton wrote

concerning three queries of mine that Professor Fulton had referred to her by letter. After disposing of the first and second, she went on: “(3) *Stanislas Tanchou*, about whom I judge you are particularly concerned, gave me the most trouble — in part because I did not go about my research very intelligently! The first gentleman of that name whom I found was born in 1791 and died in 1850; and as he seemed to be concerned about cutting for the stone, I feared he was not your man. Finally, in the second volume of the first series of the *Catalogue of the Surgeon General's Office* (p. 674) I came upon your man and found the two following items:

“Recherches sur la fréquence du cancer. *Gaz. d. hop. Par.*, 1843, 2. s.v., 313.

“Sur la fréquence croissante des cancers. *Compt. rend. Acad. Sci. Par.*, 1844, 18, 878.

“I am sorry to say the library does not have either one of the journals quoted ...”

The Tanchou who was dismissed by Miss Stanton for having been born in 1791 turned out to be the right man, and he was also the Tanchou of the other two references. Our Tanchou, as I was to learn, was old enough in 1815 to serve with Napoleon during the Waterloo campaign.

In the hands of the Dartmouth research staff, Miss Stanton's information proved fruitful. In three months we had secured both her references, and much more; but as yet we had not found what we supposed to be Tanchou's most important works — which seemed to be in manuscript.

Meantime, with both Yale and Dartmouth having trouble, I decided to try more sponging on friends, this time turning to France. I wrote to Dr. Alexander Berglas, member of the Cancer Research Foundation of the Pasteur Institute, whose book *Cancer* has been one of my most valuable sources. Like Fulton, Berglas proved not to be at home when my letter reached his address; but his research associate, Mrs. Edith Herschel, spoke with him by long-distance telephone and wrote me on May 29, 1958:

“Regarding the works of Stanislas Tanchou, who is unknown to us, we have as yet not been able to obtain any information.”

When this letter reached me, I thought of Miss Stanton's remark that she had difficulty locating Tanchou because she had started wrong. Had I got off to a wrong start too — perhaps in searching for Tanchou direct, and not through his sponsor in the United States, whose name was given in our references as “Dr. John Le Conte”? I had assumed Le Conte to be a less prominent figure than Tanchou, his principal. Appropriately it now struck me that Huxley was far from obscure when he sponsored Darwin. So I took down from its shelf the “L-Mac” volume of the *Dictionary of American Biography*. And there I found three Le Contes. No wonder the Le Conte name had sounded familiar — all three were among the foremost scientists of their generation! One of them, the required John, had been president of the University of California. When he died, the memorial published by the National Academy of Sciences of the United States said of him, “More than any other man he was the father of the university.”

The reading of the Le Conte biographies — those of John, John Lawrence, and Joseph — bore doubly intriguing witness in relation first to Tanchou and then to the Leavitt cancer search. For Tanchou and

his views were French; the Le Contes were Americans of French descent; and John, a doctor of medicine, thus a superfit sponsor to a controversial French doctor such as I was beginning to suspect Tanchou of having been. Second, and in a way more intriguing — Tanchou's sponsor wrote for medical journals, such as my Dr. Knight could well have read; and he was one of the most popular and distinguished figures of Captain Leavitt's home port, San Francisco!

No wonder, in the light of this, Leavitt found, as he told me, that San Francisco doctors were particularly searching questioners when they learned that the Eskimos — in Siberia, Alaska, and Canada — were in his opinion literally without cancer, thus appearing to confirm what were the well-known, if controversial, views of California's leading scientist-citizen.

As to Le Conte's special qualifications for the role of Tanchou's Huxley:

John Le Conte (1818-91) received his degree in medicine in 1841 from the College of Physicians and Surgeons in New York and was preparing himself for graduate medical study in France when circumstances changed his plans and he took up instead a general practice in his native Georgia. There he read, in French and British medical journals, summaries of a memoir on cancer which had been submitted by Stanislas Tanchou in 1843 to the Academy of Sciences in Paris. No doubt Le Conte's interest and approval were strengthened through his discovery that the Parisian scientist had independently reached conclusions in regard to malignant disease that were similar to those Le Conte had himself published eight months ahead of Tanchou, in a “Monograph on Cancer” which he read before the Society of Alumni of the College of Physicians and Surgeons of the State of New York on October 18, 1842.

Now from his Savannah address where he was a beginner in the practice of medicine, Le Conte sent to the *Southern Medical and Surgical Journal* of Augusta, Georgia, to be printed in its issue for May 1846, the paper that introduced the views of Tanchou to the United States: “Statistical Researches on Cancer.” Among the points of agreement between the unpublished Tanchou memoir of 1843 and a published Le Conte paper of 1842, were that (1) cancer, while found in children, is pre-eminently a disease of middle and old age; and that (2) its incidence is greater in cities than in rural districts.

The Tanchou pronouncement, which Le Conte seemingly expected would be startlingly novel to his readers, and in which Le Conte does not claim to have himself preceded Tanchou, is broached first on pages 273-74:

“M. Tanchou is of opinion that cancer, like insanity, increases in a direct ratio to the civilization of the country and of the people. And it is certainly a remarkable circumstance, doubtless in no small degree flattering to the vanity of the French savant, that the average mortality from cancer at Paris during 11 years is about 0.80 per 1,000 living annually while it is only 0.20 per 1,000 in London!!! Estimating the intensity of civilization by these data, it clearly follows that Paris is 4 times more civilized than London!!

“Seriously, however, the greater frequency of carcinoma in France, as compared with England, is a very curious fact.” Le Conte discusses whether differences in registration methods can account for this difference in figures and concludes that there could be some difference; but he decides that “it is totally inadequate to account for the remarkable disparity in the mortality from this cause (cancer) in

the two countries.”

Here Le Conte introduces a table, apparently copied from Tanchou, comparing cancer deaths in England and Wales with the French, and concludes that “after making due allowance for the difference in the systems of registration, the mortality from cancer in the department of the Seine is nearly quadruple what it is in England and Wales. Hence it is clear that the general preponderance of the disease on the continent cannot be reasonably ascribed to any diversity in the classification of kindred diseases.”

On page 275 Le Conte asks, “How will we account for the supposed fact that carcinomatous affections are on the increase? To some extent, the augmentation may be only apparent ...” This he considers, and his verdict is that “if this is the true cause of the increase in frequency, it must indeed be co-extensive with the progressive advancement of civilization, unless some countering influences are brought to bear ...”

Apart from his clear way of writing, Le Conte's 1846 support of the Tanchou Doctrine cannot have been material; for he was then but a recent medical graduate practicing in a small town and writing for one of the smaller medical journals. But his adherence was to prove staunch and was to continue active through a long career in which he rose in popularity and in scientific prestige. Though his general interest shifted from medicine through physiology and chemistry to physics, and eventually to organizing and running a university, he continued gathering and publishing cancer statistics and reiterating the Tanchou idea that “native” people have little or no malignant disease but that they succumb to it when they become Europeanized.

After holding professorships at various colleges in the South and East, including the chair of chemistry at the College of Physicians and Surgeons in New York, Le Conte found himself by 1869 in the far West as professor of physics and also the first (acting) president of the University of California.

San Francisco had been, since the days of '49, the U.S. gateway to the North Pacific. In 1867, two years before Le Conte's arrival, it had become in a special way the portal to that Russian America which was changed by purchase into Alaska. Thus San Francisco was also the home port for the two northwestern activities that concern us most, those of the Alaska missionaries and of the Alaskan and northwest Canadian whaler traders, from which two groups is derived much of the information used in this book that bears on the Tanchou-Le Conte view of cancer's relation to the Europeanization of native populations.

After having been acting president of the University of California through its first year, Le Conte reverted to a mere professorship, and to writing (and perhaps lecturing?) upon the incidence of cancer. In his third San Francisco year he published, through the local *Western Lancet*, for March 1872, an article in which he again put forward “Tanchouism,” this time in connection with an appeal for more frontier information bearing upon the doctrine. This article is “Vital Statistics: Illustrated by the Laws of Mortality from Cancer.”

Presumably this second article, published in between Le Conte's two presidencies of the university, was the one which — directly or through notice in other medical journals — reached Dr. Knight and

thus may have initiated the Leavitt frontier search for malignant disease.

Apart from that problematic special effectiveness, still more effective in supporting Tanchouism was no doubt Le Conte's further return to the charge, in 1888. By then he had been re-elected president of the University of California; and now his medium of publication was the *Tenth Biennial Report of the California State Board of Health* (Sacramento). On page 181 of the report, President Le Conte uses almost the same words he had used forty-two years before as a young doctor in Georgia: "It is the opinion of M. Tanchou that cancer, like insanity, increases in a direct ratio to the civilization of the country and of the people ..."

On page 182 of the Board of Health report there is a mixture of the old wording and a new, and there are new statistics: "Perhaps the habit of making necroscopic examinations may be more common in the French metropolis than it is in England, and thus a greater number of internal cancers may be detected and registered. But it is hardly reasonable to suppose that the disparity growing out of this circumstance would amount to the enormous proportion of 4 to 1.

"In view of M. Tanchou's idea, that the mortality from cancer is in direct ratio to the intensity of human civilization, it may be to some extent consolatory to the inhabitants of England to discover that their recent mortuary records, from 1860 to 1867, indicate a very remarkable increase in the death rate from this disease."

An indication of the wide and respected circulation of the Tanchou idea, through Le Conte, is found in the fact that Prudential Insurance Company of America issued in 1915 its aforementioned *The Mortality from Cancer Throughout the World*, and that this book, though it quotes all sides, is sympathetic to what I think of as the frontier doctor position on malignant disease. As for Le Conte on Tanchou, Hoffman mentions all three of Le Conte's main publications — those of 1846, 1872, and 1885; but he uses chiefly the wording of the last.

I do not remember Captain Leavitt's ever mentioning Tanchou or Le Conte in telling me what his doctor brother had said of the medical profession's division over whether "natives" are free from malignant disease or not. But his presentation, as I remember it, was so much in the Le Conte spirit that I feel inclined to believe, as I say, that Dr. Knight got from the *Western Lancet* article of 1872, or from its equivalent, the arguments which he used with Leavitt in 1885 to urge upon him a search for cancer among the Eskimos. In any case, paraphrases of the Tanchou doctrine, and of the Le Conte presentation of it, are frequent in the medical literature of the frontier. This I shall now proceed to indicate by quotation.

Summarizing under "Cancer among Primitive Races" such reports from the frontier as were available to him up to 1914, Hoffman says on pages 146-47: "The rarity of cancer among native races suggests that the disease is primarily induced by the conditions and methods of living which typify our modern civilization ...

"... a large number of medical missionaries, and other trained medical observers, living for years among native races throughout the world, would long ago have provided a more substantial basis of fact regarding the frequency of occurrence of malignant disease among the so-called uncivilized races, if cancer were met with among them to anything like the degree common to practically all

civilized countries.

“Quite to the contrary, the negative evidence is convincing that, in the opinion of qualified medical observers, cancer is exceptionally rare among the primitive peoples, including the North American Indians and the Eskimo population of Labrador and Alaska.”

Hoffman's *Cancer and Diet* has a section on “Dietary Theories of Cancer.” From his sketches of these theories I have selected a number which bear, to my mind the impress of Tanchou, directly or through an intermediary such as Le Conte. The page references below, are from the Williams and Wilkins (Baltimore) edition of 1937:

Page 18: “... in 1865 there was published in London interesting volume on *The Antecedents of Cancer* by Charles H. Moore ... In brief, he connects the progress of civilization with the increase of cancer, which has remained an incontestable theory to the present day.”

Page 25: “In 1882, Dr. W. Mitchell Banks ... published in Edinburgh an important paper ... [which includes] ‘Cancer is on the increase in this country. Is it possible that this is coincident with our full habit of living, as a people?’”

Page 28: “In 1896 D. A. Babagliati ... published in London a small treatise on *Air, Food and Exercise* ... [He was] the first to establish the dietary origin of cancer, and his various books gave abundant evidence in support of his contentions.”

Page 40: Hoffman quotes from Dr. Charles Powell's *The Pathology of Cancer* (Manchester, 1908): “There can be little doubt that the various influences grouped under the title of civilization play a part in producing a tendency to Cancer.”

Pages 46-47: “In 1914 there was published in New York by Dr. William Seaman Bainbridge, surgeon at the New York Skin and Cancer Hospital, an outstanding contribution of *The Cancer Problem* [in which Dr. Bainbridge, says] ‘... (man) in his primeval condition ... has been thought to be very little subject to new growths, particularly to those of malignant character. With changed environment, it is claimed by some, there came an increase in susceptibility to cancerous disease, this susceptibility becoming more marked as civilization develops; in other words, as environment changes.’

“With particular reference to the nutritional theory, Bainbridge observes that ‘It is held by some that cancer and cancer-like growths, whether in plants, animals or man, are due to changes in nutrition which cause altered growth and impaired development, the fundamental physiological and pathological processes being the same in plants and animals ... The influence upon cancer incidence of climate, soil, diet and habits of life, has not been proved. In other words, it has not been established that any of these factors are potent to absolutely prevent the occurrence of cancer.’”

Pages 49 ff.: Here are numerous quotations from Dr. L. Duncan Bulkley, senior surgeon at the New York Skin and Cancer Hospital. One quotation may be in its phrasing an echo of Theodore Roosevelt's campaign for the Simple Life. Says Bulkley: “‘The simple life, with the avoidance of the dietetic and other causes which have been found to induce cancer in nations and individuals, promises the best hope for the arrest of the rapidly increasing development of cancer throughout the

world.””

But the Theodore Roosevelt slogans invoking the Strenuous Life, the Simple Life, Plain Living and High Thinking, were replaced by slogans extolling the Full Dinner Pail, Two Chickens in Every Pot, the High Standard of Living. And, perhaps as a mere coincidence, the malignancy rates maintained their steady rise.

Page 59: Hoffman quotes J. Ellis Barker's 1924 book, *Cancer: How It Is Caused, How It Can Be Prevented*, to the effect that the rates of cancer death and of sugar consumption were going up together.

Page 66: Here Hoffman quotes a paraphrase of his own 1923 lecture. This includes a statement to the effect that “cancer is extremely common among all civilized peoples and ... the rate is increasing practically everywhere. And he pertinently asks what are the conditions peculiar to civilized peoples, and absent from primitive races, which are associated with its prevalence and increase in the former, and its almost entire absence or relative infrequency in the latter?”

Page 67: “In 1926 Dr. Morley Roberts published in London a treatise on *Malignancy and Evolution* [this includes] ‘... I take the view commonly held that, whatever its origin, cancer is very largely a disease of civilization ...’”

On the same page Hoffman quotes himself as having published among others, these conclusions: “Cancer is unquestionably very rare in native races not in contact with the customs and habits of civilized populations ...” On page 666, summarizing the preceding pages of *Cancer and Diet*, Hoffman says that “far reaching changes are called for in the normal dietary habits of the American population as a means of preventing the increasing loss of life due to cancer ...”

When we turn from Hoffman to other sources, especially if these are dated after 1926, we find a chorus of approval for the new animal experimentation. The trend of these favorable opinions is well known, because they triumphed. But there were a few dissident cries, less noticed because they were on the losing side; they are the more in need of repetition now. I shall pick up and use a few.

In October 1926, the frequently dissident New York journal *Cancer* published an article from London by Dr. Stanton Hooker, “Eclecticism in Cancer Therapy.” This, in effect, was favorable to the nineteenth-century, or medical-missionary, approach and deplored concentration upon producing cancer in beasts artificially and then watching them sicken and die — all with the hope, of course, of finding out how to stop the trouble the experimenters themselves had started, they talking optimistically meanwhile. Said Dr. Hooker:

“There is, as a matter of fact, a growing group of independent thinkers — both lay and professional — who are anything but impressed with the story of the discovery and isolation of the ‘cancer germ’ ... Mr. Ellis Barker has also written reiterating his views in common with those of Sir Arbuthnot Lane, my own, and many others, that cancer is a disease of civilization, caused by wrong eating, drinking, and other factors ...”

Hooker quotes Sir Arbuthnot Lane: “Possibly some cancer research institution may find a cure for

cancer, but the chance of their doing so is infinitely small.” Implying that we already know that cancer is prevented or retarded by certain diets, promoted by others, Hooker says, “The medical slogan of the near future will be: ‘Prevention is better than cure ...’” Hooker paraphrases Dr. Hastings Gilford: “His general statement is that civilization is the cause of cancer.”

In the July 1927 issue of *Cancer* is an article by Dr. William Howard Hay of Buffalo, N.Y., “Cancer a Disease of Either Election or Ignorance.” The trend is the same as that of Hooker's article, favoring the nineteenth-century approach to the cancer problem and with a strengthened attack upon the twentieth-century version:

“Think back over the years of cancer research, of the millions spent, the time consumed, the pains expended ... and where are we today? Is it not time to take stock of our basic conception, to see if there is not something radically wrong with this to account for the years of utter and complete failure to date? ... Cancer has been consistently on the increase ... since the advent of the Society for the Control of Cancer; with the millions of endowed effort, this increase has been accelerated ...

“A study of the distribution of cancer, among the races of the entire earth, shows a cancer ratio in about the proportion to which civilized living predominates; so evidently something inherent in the habits of civilization is responsible for the difference of cancer incidence as compared with the uncivilized races and tribes. Climate has nothing to do with this difference, as witness the fact that tribes living naturally will show a complete absence of cancer till mixture with more civilized man corrupts the naturalness of habit; and just as these habits conform to those civilizations, even so does cancer begin to show its head ...

“Is it possible the cause of cancer is our departure from natural foods? It would surely look so to any man from Mars; but we have so long lived on processed foods ... that we are in a state of unbalanced nutrition from birth ... we have come to regard these foods as the hallmark of civilization, when it is a fact that these very foods set the stage for every sort of ill, including cancer ...”

Up to this point we have been dealing with Tanchou's theories as they have been echoed in the United States and Britain, which echoing we think may have been started by the 1846, announcement of the “Tanchou Law,” which is, in Dr. John Le Conte's wording, “The mortality from cancer increases in a direct ratio to the civilization of the country and the people.”

Now let us turn to a similar Old World review of Tanchou's ideas, beginning with France.

4. The Tanchou Principle At Home: In France And In Africa

As I have indicated, the ideas of the mysterious M. Tanchou had spread, since their introduction to the U.S. in 1846, with the potent assistance of Dr. John Le Conte and others, to the regions of Alaska and northern Canada where uncivilized people still lived and might be observed.

But of Tanchou himself I was for some time able to learn practically nothing beyond what was to be inferred from the articles dealing with his views that were published by Le Conte at the mentioned intervals 1846-1872-1888. Even from these I received a disquieting and tantalizing sense of bewilderment. Apparently Le Conte, who clearly believed that an extensive manuscript on cancer had been entrusted to the French Academy by Tanchou in 1843, had never been able to see this manuscript nor any full publication of it — had seen nothing beyond some fairly lengthy summaries.

Feeling sure that such a manuscript must still exist, and thinking that probably it had been published or that longer extracts from it had been, I sent the aforementioned appeal to Dr. Alexander Berglas, member of the Cancer Research Foundation of the Pasteur Institute, to receive in reply a friendly and co-operative letter dated June 2, 1957, which however contained the sentence, “Regarding the work of Stanislas Tanchou, who is unknown to us, we have not as yet been able to obtain any information.”

This unawareness of Tanchou, coming from a center of French cancer studies, might perhaps have been dismissed as just a further instance of the Biblical principle that a prophet is not without honor save in his own country. But the quotations that were used by Le Conte, from a Tanchou memoir which the French Academy had in its custody, appeared to me to show that Tanchou had relied heavily on African sources for support of his thesis: “Mortality from cancer is in direct ratio to the intensity of human civilization.”

So I would at least go one step further and check as best I could on published cancer material from Africa. If I could learn nothing of Tanchou himself, I might nevertheless find African testimony for or against Tanchou's ideas.

First I turned to the cited Hoffman compendiums, the 1915 *Mortality from Cancer Throughout the World* and the 1937 *Cancer and Diet*. Among applicable references I found one in the 1937 book that does face squarely the issue of whether the advancing of Europeanization has been considered to have promoted cancer in Africa. The source given on Hoffman's page 41 is *Cancer: The Problem of Its Genesis and Treatment*, by Dr. F. W. Ross (London, 1912):

“... the savage negro in the interior of Africa is enjoying ‘His comparative immunity from cancer because his method of preparing his food and drink is different in every essential from the methods used by the more civilized negro and white man ...’”

An even more striking proof that a prophecy may be familiar to those who have forgotten the name of the prophet, is found in the already mentioned, important *Cancer: Its Nature, Cause and Cure*, published in English during 1957 at Paris by Dr. Alexander Berglas of the Pasteur Institute. Throughout the book runs the theme that cancer is a disease from which the nature peoples are relatively or wholly free. A most noteworthy statement of this view is contributed by Nobel laureate

Albert Schweitzer in a preface from which I quote by permission of Dr. Berglas.

The sketch of Schweitzer begins, “Missionary surgeon, founder of the hospital at Lambaréné ...” The Schweitzer preface includes:

“On my arrival in Gabon, in 1913, I was astonished to encounter no case of cancer ... I can not, of course, say positively that there was no cancer at all, but, like other frontier doctors, I can only say that if any cases existed they must have been quite rare. This absence of cancer seemed to me due to the difference in nutrition of the natives as compared with the Europeans ...

“In the course of the years, we have seen cases of cancer in growing numbers in our region. My observations incline me to attribute this to the fact that the natives were living more and more after the manner of the whites ...

“I have naturally been interested in any research tracing the occurrence of cancer to some defect in our mode of nutrition ...”

What we know to be the essence of Tanchou's thinking was, then, endorsed from France and from French Africa by Drs. Berglas and Schweitzer, among others. So the mystery deepened of how the prophet could be so completely forgotten when the fulfillment of his prophecy was so well attested.

This mystery I was about to drop, as beyond my power to solve, when the possibility of solution came through a piece of news. My friend Phil White, distinguished cancer specialist, had been invited by the University of Paris to give a series of lectures. For half a year he would be associated with the present “Immortals” of France, whose Academy was custodian of the Tanchou memorial, if it still existed, and surely custodian of memories and records concerning it. Would Phil undertake the search? He would.

Since then the Whites have spent the half year in Paris, a good share of it in difficult and intricate pursuit of Tanchou clues and facts. We shall present Phil White's report below, but first we should like to present him to readers who are not cancer specialists.

According to *American Men of Science*, following 1945 Philip R(odney) White spent a number of years as senior member and head of the Division of General Physiology at the Institute of Cancer Research in Philadelphia. He now holds a similar position in cancer research with the Roscoe B. Jackson Memorial Laboratory in Bar Harbor, Maine. During the season 1958-59 he was on leave of absence for a year, lecturing about cancer and conferring on its problems, in France and several other countries in Europe.

Report of Dr. Philip R. White on his Tanchou Inquiry

On February 13, 1959, Carol and Phil White wrote from Paris. Phil's part of the letter said:

“Yesterday I sent you a packet of papers on the Tanchou affair. Today ... Carol urged me to write a little squib of a different sort [for possible use in a magazine]. I have written one; but clearly it should have your approval, if forthcoming, before being submitted.” It received my approval and I present it

here:

“There is probably no more august body of savants in the world than that created by Descartes and Pascal, sanctified by Richelieu and the Roi Soleil, abolished by the French Revolution, rejuvenated by Napoleon; the Académie Française and its associated academies which make up the Institut de France: ‘The Immortals.’ Under the dark dome of the institute, on the Left Bank of the Seine, in the old Palace of the Four Nations, these men meet to ponder the problems of the world ...

“A year ago one of the youngest old men I know, Vilhjalmur Stefansson, arctic explorer, authority on Eskimo life, teetotal carnivore at eighty (he eats *only* [fat] meat), still exploring new trails, set me on one which has led me a merry chase. The Eskimos seem not to have had cancer under their primitive way of life. Neither do certain South American Indians, so the tale goes. Nor do the natives of Central Africa.

“A century ago a French doctor, Stanislas Tanchou, who had served with Napoleon in Russia and at Waterloo, retired to Paris and private practice after the wars. At the end of a lifetime of experience and study of the statistical distribution of cancer, by peoples, by profession, by sex, age, and habits, Tanchou propounded the theory that cancer was a disease of civilization. Coming to the attention of Californians ... the idea impressed itself upon the minds of doctors and sea captains in the Alaska trade so that the early observations on the Eskimos were more than casual notations; these men were *looking* for cancer. That they did not find it gives their data added weight.

“But this information in the hands of Arctic ship surgeons was second or third hand. Just what had Tanchou himself said, and what was the basis for his conclusions? My friend Stef wanted to know. And the Surgeon-General's lists, the Archives of the Library of Congress, were rather reticent. A few brief notes but nothing like the extensive papers which the British and American medical journals of the 1840's had ‘reviewed.’ Where were the originals? Perhaps somewhere in Paris, where one can find anything if one looks long enough. I was going for some months to Paris. Would I see what I could find?

“I love a hunt. Starting from the Surgeon-General's list I went first to the Library of the Académie des Sciences. Yes, Tanchou had presented many papers before the Academy, on a variety of subjects; in fact he had three times presented himself as a candidate for election to that body, and three times failed. Among the papers published in the *Comptes rendus des séances hebdomadaires* were two which dealt with distribution of cancer, presented in 1843 and 1844. I asked to see them. No, these were only brief notes: ‘M. Tanchou summarized as follows. ...’ And no bibliography, no cross references. Perhaps at the library of the École de Médecine? The Surgeon-General listed four papers there by or about Tanchou. One was clearly wrong: it said 1844 but the journal named didn't start publishing until 1847. Another proved to be only an obituary notice. A third was also partly wrong — the journal had twiced changed its name in 100 years — but by persistence we tracked it down, only to find that the particular weekly number which should have contained Tanchou's article was missing from the file. That left only one, an English journal of 1843. Not very promising. But here we were in better luck, for the *Lancet* appeared to have translated almost literally the missing article from the *Gazette des Hôpitaux Civiles et Militaries*. But this again was clearly an abbreviated version of a longer paper which Tanchou said he had published elsewhere. Where?

“On a hunch I went back to the Academy and asked if Tanchou might perhaps have filed a manuscript with them, a manuscript which he had hoped to publish but had not done so. Into the archives again, this time not just to their index but into the actual files for 1840 to 1845. There were many items; twenty-two case histories gleaned from the literature of the world, drawings of operations for cancer of the breast, notes on dissolving bladder stones without operation and, ah, yes, two of interest. One was a twenty-page manuscript which appeared to be, in fact, what I was looking for, though upon closer study it proved disappointing, adding nothing essential to the material in the shorter summaries. The other, however was intriguing. It was simply a notation: ‘Tanchou, deposited June 5, 1843, a sealed packet.’ That was all.

“Early in its existence the Academy took upon itself the responsibility of serving as custodian of ideas, public or private. In the seventeenth and eighteenth centuries in particular, ideas might be dangerous, and since plagiarism was common, even perfectly safe ideas might be hoarded. If a man had such an idea and wanted to establish his right to it without making it public, he could deposit it with the Academy. Thereafter he could, during his lifetime, request the return of his deposition; after his death his heirs could request that it be opened and read but could not have it relinquished to them; and, after 100 years, if requested by anyone not an heir, the Academy reserved the right to open such a packet and decide whether its contents should be published, should be destroyed, or should be returned to the archives for another century. In practice they never destroy anything.

“Was this another manuscript? It had been sealed for 116 years, I could at least see it. This required a formal letter ... A letter was dispatched and permission duly granted to ‘examine’ the packet. On my next visit to the Academy the librarian brought it to me. No, this could not be a long manuscript; it was too small, no larger than a letter, probably only a single sheet of paper. But permission to ‘examine’ did not include permission to open ... So I sat down to write a second letter ... Official approval was granted and a date set for the formal opening.

“Such occasions are impressive. The long paneled hall, a central podium for the president and the two secretaries, an oval series of desks with six transverse lines seating the eighty Immortals, benches along the walls for visitors (the sessions are open to the public), to the left, right, and front statues of Molière, Racine, and Corneille, between these, busts of Buffon, Lamartine, Pascal, Chateaubriand, Laplace, and others. The Immortals file in, sign the register, take their places. There is the usual reading of minutes; a paper is presented ... And then the announcement, ‘The Academy has before it a request from an American colleague, M. White, that a sealed packet deposited in 1843 by M. Tanchou, physician to the King, be opened ... Do I hear any objections? If not it will be done ... In that case we will open the packet.’ An officer beckoned to me to step forward ... He broke the seal and with some difficulty opened the brittle folded paper. It contained a second sealed paper. This seal was also broken and a double sheet of paper spread out ... The ink was dim and the writing ancient ... There was a word underscored in the second line, a short word. What was it? ... It was ‘SEXE’! The paper had *nothing* to do with cancer.

“My search was ended. I am not sure my friend Stefansson will be content with the result ...”

In a way, I am content with the result. Dr. White's search has, for one thing, indicated what sorts of difficulties may have hampered Dr. John Le Conte in a search for the Tanchou memoir which, it is hard to doubt, he must at some time have made — perhaps in the 1880's, with all the dignity of a

university president, preparing for his third statement on Tanchou, the one he issued in 1888.

The more formal report from Dr. White was dated February 11, 1959, two days earlier than the one just quoted. It is to the same effect, and concludes: "... Tanchou had a good idea on the effects of civilization ... He should be remembered for having *tried* to deal with the question on a statistical basis. His idea of the influence of civilization was fruitful in pointing to facts which need to be studied ..."

With the Dead Sea Scrolls throwing unexpected light on the founder of Christianity, with family revelations throwing expected light on the founder of Darwinism — with such portents, the expected or unexpected may happen to throw new light on Tanchou. But it will then probably be too late for use in this book. Therefore I shall summarize and add further bits.

Though Tanchou is now forgotten in his homeland, and though Africa may be fulfilling his prophecies without knowing they are his, it was not always thus.

It was not so in 1850, the year Tanchou died. That year, pages 487-90 of the *Revue Médicale Française et Étrangère* carry an affectionate, heartbroken, laudatory appraisal by Boys de Loury, secretary general of the Paris Society of Medicine. However, though the memorial praises Tanchou as a soldier and citizen, and is full of admiration for him as a leading and inspiring figure in the domain of medicine, it says of him in relation to cancer only, "Tanchou's researches on the diseases of women stand out particularly, and especially those on cancer."

The "Memoir on the Frequency of Cancer," which Tanchou in 1843 "addressed to the Academy of Sciences," appears to have made the following points, among others:

According to the *Hospital Gazette* (Civilian and Military) for July 6, 1843, charts show that cancer is much more frequent in Paris proper than in its suburbs: "... [the like] has been noticed in Berlin and in England ... we know that the number of cancer cases is increasing ... this disease seems to be very old in the civilized world. The first example is that of Atossa, daughter of Cyrus and wife of Cambyses, in 521 B.C. ... many cancers have been found among the mummies of Egypt; and M. Homem ... who spent 14 years in the service of Mahomet Ali, never saw cancer among the peasant women but only among the [aristocratic] Turkish women.

"Cancer is like insanity, found most often in the most civilized countries ... in the Orient it has been found more frequent among Christians than Moslems. Fabrice de Hilden believed that cancer appeared more often in the temperate zone than in the other zones. M. Rouzet says that it is very rare in Africa.

"We have gathered information on this last point that leaves no doubt. Dr. Bac, surgeon-in-chief of the Second African Regiment, never found a case in Senegal, where he practiced medicine for six years. Many other health officers of our brave army have told us the same thing. M. Baudens, surgeon-in-chief at Val-de-Grâce, who practiced civilian medicine in Algiers for eight years, said he met only two or three cases. Finally: Dr. Puzin established a civilian hospital in 1835, 10 leagues from the

front; out of 10,000 sick whom he examined there was only one cancer case, the breast cancer of a woman.”

So far as it is possible yet to tell from the documents studied, Tanchou's chief material for arriving at his law came from North Africa, and involved a higher observed cancer rate among the dominant French than among the lowly peasants. The main observations Tanchou bolstered with like Asiatic testimonies, and with statistics comparing metropolitan with suburban Paris, and Paris with England and Wales, also Paris with London. In Europe this all seemingly passed without creating emotional flurries.

In the United States of 1843, the War of 1812 with Britain was still a fresh memory; nor had the embers of the 1776 revolution quite died down. So it was the American fashion to twist the British lion's tail. In his 1846 presentation of Tanchou's ideas, Le Conte, instead of playing up the French-Africa situation as we now feel he should have done, played up the Paris-London statistics, and suggested that, from applying the Tanchou principle to the figures, “it clearly follows that Paris is 4 times more civilized than London.”

But from the Tanchou principle, applied to the African testimony, it follows even more strikingly that the French are more civilized than certain Africans — not by a mere 4 times, but by perhaps 40 times, or 400 times. (The British-French and metropolitan-suburban comparisons are carried further in Chapter 16 in the discussion of the Danish Cancer Registry studies of the twentieth century.)

Though perhaps not with the clarity that leaps to the eye when we compare Le Conte's interpretation of Tanchou's thinking with what medical missionaries think they have observed in Alaska, Tanchou's own version of his law has been confirmed too in that law's homeland, Africa; and continues being proved, at least in the opinion of medical missionaries, as has been shown in the early part of the present chapter through the 1957 quotation from the surgeon-missionary Albert Schweitzer.

Tanchou, as I have indicated, was recognized by Le Conte as contributing many other notions about cancer besides the conception of its being, in its death rate, more severe on a people the more civilized they are. One of these points, of which this review has not yet sufficiently taken notice, is that Tanchou appears to equate “civilization” and “domestication,” as to what he believed to be the canceriferous results of both. Among the documents I have read so far, this is brought out most clearly in the notice of the Tanchou memoir in the *Comptes rendus des séances de L'Académie des Sciences* (Paris), January-June 1844:

“The disease seems to occur more frequently in the cities than in the country; it is almost unknown in [the natives of] America and Africa. In Egypt one finds it among the Turkish women but not at all among the Egyptian peasants ... The disease is not rare among domestic animals, nor among those in menageries; but there are no cases known among wild animals.”

In a way, it is a satisfaction to infer that Le Conte had the same difficulty with his basic source that I have had. He apparently never saw the Tanchou memoir itself, nor any full copy of it. At least he wrote his chief paper, the one of May 1846, without this advantage. For on page 258 he has a footnote:

“For abstracts of M. Tanchou's Researches see London Lancet for August 5, 1843, Am. Ed., p. 593, from Gazette des Hôpitaux for July 6th, 1843, p. 200; and Medico-Chir. Rev. for Jan. 1844, p. 213, from Gazette des Hôpitaux.”

Nor did Le Conte add materially after 1846 to his citations of Tanchou, either in his 1872 *Western Lancet* article or in the last of his formal summations, in the *Tenth Biennial Report of the State Board of Health of California* (1888). What Le Conte does add is support of Tanchou's conclusions from other sources.

No doubt Le Conte had the advantage over me that he read current discussions of the Tanchou memoir other than those I have yet seen. And then, as Le Conte emphasizes in his “Statistical Research on Cancer,” he had actually himself studied, and publicly commented upon, much of the evidence which Tanchou is said by his various reviewers to have used. Indeed Le Conte had used some of this evidence more than a year ahead of the Tanchou notice of July 6, 1843. In another 1888 footnote Le Conte says of his own publication:

“This monograph on Cancer was read before the Society of Alumni of the College of Physicians and Surgeons of the University of the State of New York on the 18th of October, 1842; and was published in the first number of their ‘Transactions,’ and likewise in the New York Lancet for Oct. 29th and Nov. 5th, 1842, pp. 484 and 299.”

With this digressional summary of nineteenth- and twentieth-century opinion and testimony concerning the relation of European culture to the cancer problem in Africa, and concerning how Tanchou's ideas are thought to have measured up to African eventualities, I shall now return to my main theme, the observations and opinions of frontier doctors and nurses relevant to the malignancy problem in Alaska and northern Canada.

5. The Moravians Search For Cancer In Southwestern Alaska

In 1888, as I have said, the California State Board of Health published Le Conte's third presentation of the Tanchou hypothesis, that cancer is a disease of the civilized. At this time George Leavitt was in the sixth year of his vain search for cancer among the uncivilized natives of northern Alaska. He was hearing from the more civilized southern parts of the territory that malignant disease among natives was known there.

In 1896 a man destined to become the territory's most famous doctor reached southwestern Alaska fresh from medical school; he was Kansas-born, Austrian-descended Joseph Herman Romig. His observations and views on cancer, in relation to Alaska natives, were soon to become well known locally. They do not appear to have reached international circulation until 1939, through the publication of the widely noticed *Nutrition and Physical Degeneration* by Dr. Weston A. Price (New York and London). In regard to an interview between these two in 1933, I quote the cited book from the fourth American edition (1945), pages 90-91:

“Anchorage ... has an excellent government hospital which has been built around the life of one man who, many people told us, was the most beloved man in all Alaska. He is Dr. Josef [Joseph] Romig, a surgeon of great skill with experience among the Eskimos and Indians, both the primitive and the modernized ... He stated that in his thirty-six years of contact with these people he had never seen a case of malignant disease among the truly primitive Eskimos and Indians, although it frequently occurs when they become modernized.”

This being a forthright confirmation of the Tanchou-Le Conte principle, I shall go at special length into the competence of the witness and into his opportunity for continued observation of large numbers of people, many of whom he knew — some of them through having officiated at their birth or baptism.

The territory most specifically observed by Romig is Temperate Zone southwestern Alaska, south of the Yukon River and west of a line drawn north from Seward and Anchorage to Fairbanks. The Europeanization of these parts started in the 1740's, soon after Bering's visit, and was intense in the Aleutians and along mainland Alaska's south coast and the southern west coast. There were little-touched sections, particularly the west coast farther north than the Kuskokwim; and then the interior, which is forested and chiefly inhabited by Athapaska Indians. So there were districts and families that had been “modernized” even before Romig first came; but there were others still so primitive that we might consider them untouched by such influences as those of European foods and food-handling methods. Which these little-influenced spots were, the medical missionary, when of sympathetic temper, would soon know. The total population, before the 1900 measles epidemic, would have been considerably more than 10,000; after the measles, considerably less.

During his first seven years, 1896-1903, Romig worked from Bethel, the Moravian mission on the lower Kuskokwim. He traveled considerably, by dog team in winter and canoe or launch in summer. His patients were chiefly Aleuts, Eskimos, and Athapaskans; but there was a scattering of Russian and other European whites, and of Chinese, Japanese, and Negroes. Some native women were married to these immigrants. They and their children were the chief modernized elements among

whom — as among the immigrants themselves — Romig was now and then discovering malignancy cases.

In 1903 Romig ceased his formal employment in the Moravian Church, though he was to be closely affiliated with it during most of the next forty years. Upon resigning, he went to San Francisco and entered private practice. But in 1906 he lost both house and office through the earthquake and its fiery aftermath. Thus uprooted, but also because he liked frontier service, he returned to Alaska, first as a cannery doctor on Bristol Bay, just south of the Kuskokwim. His patients, more than half of them, were now whites, Asiatics, and a few modernized natives — Aleuts, Eskimos, and Athapaskans. Romig still traveled widely and kept in touch with people whom he regarded as strictly primitive, though they were using a small amount of European foods, chiefly tea and a little bread.

Resigning from the cannery work after some years, Romig became a government doctor and a health and welfare officer, traveling as before and with patients from all nationalities and classes, the natives still ranging from the most modernized to the most primitive. When the federal government started building railways, he served in their hospitals and was for the last few years chief surgeon of the largest hospital of Alaska, at Anchorage — where he was interviewed during 1933 by Dr. Price, as quoted above.

In 1940, when I first met Romig, he was gradually severing his government connections but was still living in Anchorage. Among other things, I asked him then if he had been rightly quoted by Dr. Price — on cancer, dental caries, scurvy, and on that whole group of diseases which are usually considered by medical missionaries to be largely nutritional. He said he had been in the main quoted accurately by Price in his book. He specifically confirmed that he had been rightly quoted as to cancer.

In 1948 my staff in New York was editing an arctic encyclopedia for the Office of Naval Research, United States Navy. We asked Romig for an article on Eskimo health and welfare, as he had observed it during the first few years he spent in southwestern Alaska, immediately following 1896. I promised him we would rewrite his material and let him see it before publication. Relying on this, he sent us a first draft, as he himself (evidently) had typed it. But he died before we rewrote it; and, apart from a few omissions and some added punctuation, I shall use his wording here, quoting whatever appears as possibly having some bearing on cancer. The statement, about 1,000 words, is undated; but our records show we received it in New York on December 12, 1948.

It is written on a letterhead: “J. H. Romig, M.D., 115 East Columbia, Colorado Springs, Colo. ... 1948 ...” and signed, in ink, “J. H. Romig, M.D.” In the first part of this paper he speaks of himself in the third person:

“When Dr, J. H. Romig went to the Bering Sea region of Alaska, in the year 1896, he found the Eskimos living according to tradition, ideology, and diet, the same as they had lived for hundreds of years before.” He gives the general impression of average good health and considerable longevity. He describes their houses and housekeeping and tells that during winter most of the men spend much of their time at what whites have called club houses or bath houses, the native *karrigi* or *kadjigi*.

“The women brought the largest meal of the day to their husbands, fathers, and sons. The food was in a wooden dish ... mostly game and fish ... Dried smoked salmon was much used, and other dried fish.

Seal and fish oil was much in demand and was a necessity; no one could be well without fats. Their food was cooked mostly by boiling, and was rather rare; they ate as well, especially in winter, raw frozen fish and raw meat. They kept some wild cranberries for the favored dish of *akutok* — made [of lean meat and] of seal or fish oil mixed with warm tallow, sprinkled with cranberries, stirred, and hardened with a little snow.

“On this diet the people were strong, and did not get scurvy ... the did not have gastric ulcer, cancer, diabetes, malaria, or typhoid fever, or the common diseases of childhood known so well among the whites. For the most part they were a happy, carefree people ...

“With the advent of gold discovery, government schools and missions, and the high price of furs, came a new era ... They were able to buy white men's food and clothing, neither of which fitted their real need. The children were sent to school and learned white man's ways ...

“These people have changed from the old way, to eating pancakes with syrup and canned goods from the store. The children have poor teeth now, as well as the older ones. They have white man's epidemics, and neither the home nor the food that once was good for them ...

“The Government is now doing much to cover up and ease these changes in native life ... It is with regret that we can see the slow passing of these once hardy people ...”

Next after Leavitt and his group of north Alaska revenue doctors and medical missionaries, Romig is our most important witness for what the typical Alaskan medical missionary believed himself to have seen and for what conclusions these early observers drew. Therefore it seemed important to obtain, from the few men still living of those who knew Romig in his early and middle period, some further information as to his character, reliability, and competence. Letters have come from two of these.

Benjamin D. Stewart, of Sitka, Alaska, is a retired territorial commissioner of mines, now past eighty, who knew Romig in his middle years. I sent him for comment the Price interview of 1933, including the statement that Romig was a surgeon of great skill and that he was “the best loved man in all Alaska.” Mr. Stewart replied February 6, 1958:

“As to my first-hand knowledge of Dr. Romig, I can confirm all of the good things said of him in the extracts you sent ... I knew him well during the time he was in charge of the Railway Hospital in Anchorage and later when he was for a time practicing privately in Seward. In fact I called on him to help me recover [from a heart attack] ... I have always believed [that he] actually saved my life. Naturally I have always looked upon him as a highly skilled doctor ... There is no doubt he was widely beloved and that he was regarded as the outstanding doctor in Southwestern Alaska.”

The second letter on Romig is from the Reverend Henry H. Chapman, rector of St. Peter's-by-the-Sea, Sitka, who wrote September 8, 1958:

“My father was a missionary of the Episcopal Church at Anvik, Alaska. I was born in Anvik, in 1895. The native people of that area are [Athapaska] Indians. My acquaintance with Dr. Romig dates from

the years 1923-27 when I was in charge of the Episcopal Church at Fairbanks. Dr. Romig was my physician, surgeon and friend during those years. At that time the Episcopal Church maintained a boarding school for Indian boys and girls at Nenana, 65 miles south of Fairbanks. Dr. Romig used to visit the mission periodically examining the children in the school ... always without charge.”

This is the sort of man and physician it was who told Dr. Price in 1933 that “he had never seen a case of malignant disease among the truly primitive Eskimos and Indians, although it frequently occurs when they become modernized.” Confirming this to me in 1940, Dr. Romig further indicated, both then and later, that he looked upon cancer as nonracial in its selection of victims. He thought it certainly environmental in its cause, and probably nutritional.

Romig thought it interesting to compare malignancies with other troubles that were extremely rare, if found at all, among the primitive Athapaskans and Eskimos of southwestern Alaska around 1900. What some of these rare or missing diseases and troubles were we here set down alphabetically from two sources, the extended text of the Price interview [from which we earlier extracted the quoted remarks on cancer], and then the 1948 paper which Romig submitted in first draft as a contribution to our *Encyclopedia Arctica*. According to Romig, the very rare or missing nutrition-linked difficulties of the pre-Europeanization time were these, among others: appendicitis, arthritis, beri-beri, cancer, caries (dental), constipation, corpulence, diabetes, epilepsy, gall stones, gastric ulcer, hypertension, night blindness, pellagra, rheumatism, rickets, and scurvy.

Southwestern Alaska thus briefly considered, I shall turn east and south, postponing for the time being a discussion of the medical missions of northern Alaska. Let us now travel 3,000 miles southeast to another Moravian Eskimo field, that of northern Labrador.

6. The Moravian Search In Northern Labrador

Samuel King Hutton, still active as a board member in the management from London of the Moravian Mission to Labrador, began his field service in easternmost subarctic Canada during the summer of 1902. He was graduated with a degree in medicine from the University of Manchester, and many of his published writings are in the field of Eskimo health and welfare; but he is most widely known for that standard general work, *Among the Eskimos of Labrador* (London and Philadelphia, 1912). This is subtitled "A Report of Five Years." More pertinent to our cancer inquiry is his specifically medical book published thirteen years later, in 1925, *Health Conditions and Disease Incidence among the Eskimos of Labrador*, which might well have been subtitled "A Report of Eleven Years." It covers the period from Dr. Hutton's arrival at the Labrador mission in 1902 until he left the medical service of his church in 1913 for private practice in Britain — or so he intended; his intention was interfered with by medical service with the British Army on the French front in World War I. Since that war he has been in British private and hospital practice, keeping in touch with the health problems of the Labrador mission through membership in the board that governs it.

As a background for examining the testimony and opinions of Dr. Hutton's *Health Conditions*, which deals with the period during which traces of Eskimo cancer were still being sought in vain by frontier doctors in Labrador, I shall sketch the history of the Moravian mission.

In a sense, the Moravians came to eastern Canada from Greenland, where they claim to have begun their mission work in 1733. It was already known that Eskimos speak one language all the way from Greenland across North America to northeastern Asia. It seemed logical to the United Brethren, when they had learned Greenlandic Eskimo, to extend their work southwest across Davis Strait to the Eskimos of Labrador. But it turned out that the Moravians encountered in Labrador difficulties other than linguistic. Although they began trying in 1752, they do not consider their Canadian foothold to have been secure until 1771. From that year, their relations with the Eskimos of what is now the Province of Newfoundland became steadily closer and more friendly.

Almost or quite from the beginning, it was in Labrador a cardinal purpose of the Brethren to keep the natives from dependence on the white man. In Labrador this meant, among other things, for the Eskimos to continue eating the food they knew how to secure from their waters and the land, to keep on dressing in skins, and to continue burning seal oil for both warmth and light. At first the motives of the Brethren in this were mainly economic and spiritual. But they soon concluded that, for the native, such independence was healthful physiologically as well as psychologically, a conviction that we shall find running through Dr. Hutton's medical articles and books, as indeed it runs through the whole literature of the Labrador Moravians, which is extensive both in German and in English.

So successful were the Brethren in keeping the natives to their native ways that after more than a hundred years, when young Dr. Hutton in 1902 reached their central station at Nain, he found himself coming to a well-established mission at which Eskimos were reading and writing in their own language, some of them also in German. These native North Americans were thinking and speaking European thoughts as well as those of their own people, but still they were un-Europeanized in their physical way of life. Their diet still consisted of flesh foods, most of which they ate raw and without salt; their dwellings were still the original

native-style earth-and-wood houses, lighted and warmed with Eskimo seal-oil lamps. Their clothes were still skins; and they were still healthy — healthy to a degree which is specified in Dr. Hutton's numerous writings, particularly in his *Health Conditions*.

If there are contradictions between Dr. Hutton's earlier and later publications these surely, in the main, result from his gradually coming to see and understand what he previously not noticed or had misinterpreted through lack of background. Taking his later writings to represent his most considered views, and striving for brevity, I shall confine this discussion to the *Health Conditions*, accepting the doctor's own characterization of his earlier Among the Eskimos as only a “Report of Five Years” — the first five. Besides, I have his assurance (obtained by long-distance telephone when he was in the United States on a lecture tour in 1957, and since confirmed by letter) that he has no feeling of having changed since 1925 the views on health and disease in Labrador which he developed during the fieldwork period 1902-13. True, I asked him particularly about his 1925 views on *cancer*, and it was on cancer that he replied specifically.

In the present chapter it is my main hope to convey Dr. Hutton's views on malignant disease and its relationships and to make clear his reasons for holding these views. But there is about his writings an underlying consciousness which I have nowhere found him expressing in marshaled words. He thinks that whatever degree of cancer immunity the native way of life may have conferred must be regarded as a by-product of general health — though, as will appear, he does single out factors that he thinks may have had special protective value.

As a member of the board of the Moravian Church in London, Dr. Hutton was of course one of the first to learn that in 1936 cancer had been diagnosed among the mission's own Labrador Eskimos.

I shall quote and summarize the view Dr. Hutton held in 1925 as to the relation of the former Labrador way of life to cancer, to certain other diseases of which he found no case, and to health in general. Most of the following quotations are from Dr. Hutton's *Health Conditions and Disease Incidence among the Eskimos of Labrador*.

Under the section heading, “Some Diseases Not Observed,” page 35, Dr. Hutton says:

“Some diseases common in Europe have not come under my notice during a prolonged and careful survey of the health of the Eskimos. Of these diseases the most striking is cancer. I have not seen or heard of a case of malignant new growth in an Eskimo. In this connection it may be noted that cookery holds a very secondary place in the preparation of food — most of the food is eaten raw, and the diet is a flesh one; also that the diet is rich in vitamins. The nomadic and open-air life may also play a part.

“I have not seen rickets among the Eskimos, though it occurs rather frequently among the children of European residents ... most European mothers resident on the Labrador coast find themselves unable to suckle their babies — the breasts are full of milk for a few days after birth, and then the supply ceases — the result, no doubt, of the preponderance of tinned and dried foods in the dietary of the European residents. The Eskimo mothers suckle their babies often for two years; the milk supply is plentiful, and the babies grow fat and strong, able to walk at eleven months ...

“I have never observed true asthma in an Eskimo ... Disease of the Fallopian tubes appears to be rare ...

“Appendicitis is another of the diseases which rarely appear among the Eskimos. I have seen one case in a young man, but in one living on ‘settler’ dietary; among the real meat eating Eskimos I have found no record suggestive of the occurrence of this disease ... The settler dietary consists of tea, bread, ship's biscuits, molasses, and salt fish or pork.”

Scattered through Dr. Hutton's writings are references to other diseases, omitted from this section, which were noted by him during the 1902-13 period but which were found only among white settlers or among Eskimos whose way of life had been influenced markedly by whites. Among these troubles scurvy and tooth decay are frequently mentioned.

Dr. Hutton says on page 9: “The Eskimo is meat eater; the vegetable part of his diet is a meager one ... Only the small black waterberry, *empetrum nigrum*, is eaten to any extent ... In spring the buds of the *sedum roseum* and the young shoots of the willow, *salix argyrocarpa*, are gathered and eaten. The Eskimos themselves cultivate no plants whatever, though in their inter course with missionaries they have shown a taste for garden produce, and eat what they can get. Turnips and cabbages are favorites, and are usually eaten raw; but only the few who work in the missionary households have any considerable share in this scanty garden produce. The dandelion, *taraxacum*, grows in plenty but is not eaten by the natives. We may, therefore, say that the normal Eskimo dietary is poor in vegetable constituents.

“On the other hand, the native flesh foods are numerous, and of them all the flesh of the seal is most important and the most used ... Plain raw flesh is the Eskimo's favorite food; but seal's flesh is also eaten frozen (raw), dried in the open air without salt, boiled or even rotten ... The blubber, or outer fat of the seal, is usually eaten with the dried meat.

“Other flesh foods, less important because less plentiful than the seal's flesh, are walrus meat, caribou meat, bear, fox, and various birds. These are eaten raw or boiled.

“Fish is the staple food during the warmer part of the year. Trout and cod are to be had in plenty and are eaten either fresh (raw or boiled) or dried without salt. Salted fish is used by the English-speaking settlers in the southern part of the coast, and by the Eskimos who live in contact with them; but as a general rule it may be said that Eskimos do not use salt in their food ... mussels are gathered from the rocks in the spring, and sea-urchins are fished up from the sea bed in the autumn, and both of these are eaten raw.

“A certain amount of carbohydrate food enters the Eskimo dietary; the people obtain flour, ship's biscuits and molasses, and use these particularly when their native flesh foods are scarce. It should be noted that cod liver oil is used considerably; the natives dip their dried fish in it.

“To summarize ... the diet is mainly flesh and fish; vegetable foods are decidedly scanty.”

Longevity is touched upon in *Health Conditions* in several places. One such is page 17:

“Old age sets in at fifty and its signs are strongly marked by the time sixty is reached. In the years beyond sixty the Eskimo is aged and feeble. Comparatively few live beyond sixty and only a very few indeed reach seventy. Those who live to such age have spent a life of great activity, feeding on Eskimo foods and engaging in characteristically Eskimo pursuits ... Careful records have been kept by the missionaries for more than a hundred years ...”

(Further details of Labrador Eskimo length of life will be found in Chapter 14, “The Longevity of ‘Primitive’ Eskimos.”)

Page 18: “Perhaps the most striking of the peculiarities of the Eskimo constitution is the great tendency to hemorrhage ... young and old alike are subject to nose-bleeding, and these sometimes continue for as much as three days and reduce the patient to a condition of collapse.” Dr. Hutton says that menorrhagia and haemoptysis are also common.

Page 20: “Scurvy in its typical form is rare among the Eskimos. I have seen but one case of it in a pure-blooded Eskimo: and the fact that the other members of that woman's household show an unusually strong tendency to boils, abscesses and ulcers, leads me to attribute the scurvy to the adoption, in the case of that household, of a semi-European dietary.

“Seal's flesh, especially when eaten raw, has reputed anti-scorbutic properties. Certainly, when seal's flesh is plentiful the health of the Eskimos is good; and the tribe in the far north, who get very few berries or other forms of vegetable food, but who have seals all the year round, are free from true scurvy ...”

Page 21: “In passing, it is interesting to note the effect on the Eskimo of a European dietary adopted as a habit of life.

“On the southern part of the Labrador coast there are numbers of English-speaking settlers ... these poor folks live for the most part on tea, bread and salt fish or pork, and among them scurvy is common ... The Eskimos living among these settlers have to an extent adopted the ‘settler’ dietary instead of the normal flesh diet of the true Eskimos; and not only does scurvy occur among them in its typical form, but their physique is less robust than is that of their northern brethren ... They endure fatigue less easily, and their children are puny and feeble.”

In various places Dr. Hutton agrees with the common view that an important benefit from European contact is the decrease of childbirth mortality, both of mothers and of children. He considers tuberculosis to be probably of white introduction and to have been the worst killer during his time on the Labrador.

Page 66: “Europeanization, especially in matters of foods, is a detrimental influence of comparatively recent development, but an influence of great importance ... Hospital experience among the Eskimos has proved beyond doubt that the native foods are best suited to the native constitution ...”

We have gone so extensively into Dr. Hutton's views on the general health of the Labrador Eskimo, before and during his 1902-13 clinical experience, because of the impression derived from the total of his later writings — that he considered the extreme rarity or absence of native cancer, in which he

believed, to be a by-product of an over-all good Eskimo health, which deteriorated with the advance of Europeanization.

As I have mentioned, Dr. Hutton was in the United States on a lecture tour during the summer of 1957, and I was able to talk with him, though only by long-distance telephone. I asked whether, when he returned to Britain, he would write out for me a chronological or otherwise circumstantial account of when and by whom cancer in Eskimos was first discovered in Labrador. He replied he could do so, from information which had reached London from the Labrador mission, and would be glad to. He said, however, that he felt sure the men who had informed him would be equally glad to fill me in directly. Not only had they been on the ground when the events took place but they had shared in them. He advised me to get in touch with Superintendent the Reverend F. W. Peacock, Happy Valley, Labrador.

It was the more natural for me to write Superintendent Peacock in that I had already been corresponding with him through several years in connection with a book he was writing on Eskimo sociology. He replied at once, and continued in several letters from which I shall quote. But first, to preserve a moderately chronological sequence, I shall return in my survey to the western North American Arctic, first to the Anderson River section of Canada and then to Alaska.

7. A Possible Early Cancer At Anderson River

The Anderson River of the Canadian Arctic is some 200 miles east of the Mackenzie River and some 300 miles east of Alaska. My diary for 1916 records what may be an instance of cancer in an Eskimo from this district. I shall therefore sketch the relation of the Cape Bathurst-Anderson River district to European influence.

Roderick Macfarlane, mentioned in Chapter 1, established the Fort Anderson post of the Hudson's Bay Company in the Athapaska section of this river valley in the 1860's. Although Macfarlane descended the river to the Eskimo country, and made a journey some distance east along the coast, the cultural influence of the fur trade in this district was slight, the Eskimos ascending the river to the fort chiefly to buy hardware, cloth, ammunition, and perhaps some tea and tobacco.

Contacts materially affecting the Eskimo way of life, in the Anderson district, started after 1889 and became marked when a few of the fifteen or so whaling ships occasionally wintered just east of the Anderson River, at the Baillie Islands, off Cape Bathurst, and at Langton Bay, in the southeast corner of Franklin Bay. Then it happened here, as it did more extensively at the Mackenzie delta and Herschel Island, that some youngsters took jobs aboard ship as cabin boys. Several families of the region lived around the ships when they were wintering and a few women married white and other sailors.

One Anderson River marriage was that of the woman Uttaktuak, who took for husband Peter Lopez, a native of the Cape Verde Islands off Africa who had first joined a Nantucket sperm-whaling ship bound for the South Seas and who later transferred to a New Bedford bone-whaling vessel bound for the Arctic, eventually to winter in the Anderson River section.

Uttaktuak looked to me about thirty when she and her husband were with us in a party of our third expedition that spent the winter of 1916-17 on otherwise uninhabited Melville Island, a westerly member of the Canadian Arctic Archipelago. There were among our seventeen people a half dozen Eskimos, the most westerly from the Bering coast of Alaska and the most easterly Mrs. Peter Lopez, from the Anderson River. Uttaktuak, Mrs. Lopez, was exceptionally intelligent, and well informed and lucid on how things had been in her youth. During our Melville winter I filled many pages of notebooks with varied information from Mrs. Lopez.

In 1957 I had no recollection that I had ever recorded from Uttaktuak anything that might be cancer information. Mrs. Margaret Follett, my editorial associate on a job unrelated to cancer, knew of my interest in malignant disease and, going through our Melville Island papers, happened upon what she thought might be a pertinent reference in my diary entry of November 17, 1916. The context shows that Uttaktuak and I, in the expedition's winter quarters on Liddon Gulf, had been talking about sickness and health as influenced, during the time of her childhood, by Eskimo contact with Europeans. One of the diseases we talked about was syphilis. This affliction was undoubtedly in both our minds when I recorded:

“Uttaktuak tells: Sisorinna was her grandmother on her mother's side. She died when Uttaktuak well remembers [therefore perhaps around 1900]. When Uttaktuak first remembers, Sisorinna had already

lost all the flesh around one eye; the eye was still there, though blind. She had scars lower on her face, where the flesh was not all gone. Later her skull bones began to fall out. The first [to fall out] was a small piece from the center of the top of her head. Uttaktuak says that she lived at least a year after this, perhaps several. At the last, nearly the whole of the top of the skull was gone; and the brain could be seen, covered with 'the membrane that always covers it.' She [Sisorinna] used to do as much work as other women up to her death. She finally was in bed a few weeks, during which time her whole body swelled up. She died 'because the blood got through the membrane covering it into the brain.'

This entry found, I at once copied it out and sent it to my old friend Dr. Eugene DuBois, professor emeritus of physiology at the Cornell Medical School. He advised me to place the information before Dr. Joseph C. Aub, Cancer Department, Massachusetts General Hospital, Boston, who replied on February 19, 1957:

"... it is not possible to make a definite diagnosis on Sisorinna, but certainly the description in your letter [diary entry] sounds like a basal cell cancer. It might also very well have been syphilis; and there is just a possibility, not a very good one, that it might have been lupus vulgaris. But I think either cancer or syphilis are the probable causes."

So far as my expedition papers have as yet been re-examined (up to March 1960), this appears to be the only place where an Eskimo record, which I made in the field, indicated a possible cancer on the north coast of North America earlier than the hereinafter recorded Barrow identification of 1933.

8. The Search For Cancer Among The Forest Indians Of Alaska

For support of this chapter on the woodland Indians I returned to my study of Alaska's most famous medical missionary, Dr. Joseph H. Romig, whose two sons live in Anchorage. Though formerly helpful, they were not replying to my letters; so I wrote my friend Mrs. Willetta B. Matsen, who is librarian of the Arctic Health Research Center of the U.S. Public Health Service in Anchorage. She replied, in part:

“Unfortunately, I have not been successful in getting to Mr. Robert Roming because his health has not been good this year and he has been outside for surgery — in fact is there now ... Had you noticed that in Jones, ‘Study of the Thlingets,’ there is a statement that at that time no cases of cancer (among the uncivilized woodland Indians) had been found?”

I felt the guiltier about not having consulted Jones early in this investigation because it is one of my earliest memories as a graduate student of anthropology at Harvard that we were all supposed to admire and consult this foremost authority on the woodland Indians of southern Alaska. Now that Mrs. Matsen has reminded me, he shall be the first quoted in this chapter. For Jones was on the scene four years ahead of Roming, and may have been the earlier of the two to publish views on the relations between civilization and cancer.

According to *Who's Who*, Livingston French Jones, born in 1865, graduated from Princeton Theological Seminary in 1891. From 1892 to 1914 he was a missionary and in 1914 he published at New York A Study of the Thlingets of Alaska, those woodland and shore Indians whom you pass soon after you reach Ketchikan when you come from Seattle, and all along from there to Juneau and almost to Anchorage. South of the Athapaskans, they are the most important forest Indians of Alaska. Jones says in his preface:

“The information imparted to the public in the following pages has been gleaned by the writer almost entirely from the natives themselves, either through their lips or by his own personal observation. Having lived and laboured among them more than twenty years, he has had exceptional opportunities ...” He goes on to say that he has also read widely, to compare the observations and views of others with his own.

As explained previously, it was common with northern missionaries of the late nineteenth century to name cancer as one of a group of diseases that were believed to be rare or absent. I quote from Jones the first paragraphs of his chapter on “Diseases,” and enough more to show the trend of his thinking:

“While certain diseases have always been found among the Thlingets, others that now afflict them are of recent introduction. Tumors, cancers and toothache were unknown to them until within recent years.

“The older ones have yet sound and excellent teeth while the rising generation experiences the white people's misfortune of cavities, toothache and dental torture ... The white man's food, especially his sweetmeats, which are now freely indulged in by the natives, is, no doubt, largely the cause of this change.

“While consumption is now the most prevalent disease among them, we are told by the natives themselves and by careful historians that it is an imported disease ...”

As mentioned in the first chapter of my account of frontier beliefs concerning malignant disease, Bishop Reeve told me on the Mackenzie in 1906 that he had news of cancer's having been found to the west of him beyond the Rockies, in British Columbia and in Alaska, the most civilized natives being the ones afflicted.

Our next witness is from the south Alaska coast, and the southern woodlands that are just west of Livingston Jones and not quite as far west as Joseph Romig.

Dr. J. Lyman Bulkley was born at Sandy Creek, New York, in 1879. He studied medicine from 1896 to 1900 and was graduated with the latter year's class from the medical school of Syracuse University. That year, or the next, he went to Alaska, where, after vicissitudes, he settled down to the practice of medicine at Valdez for some ten years, his last known address there being on McKinley Street. In 1927 he was associate editor of the New York City journal *Cancer*, under chief editor Dr. L. Duncan Bulkley. To the July issue of 1927 Dr. J. Lyman Bulkley contributed an article, “Cancer among Primitive Tribes,” in which he wrote:

“The observations, which the author of this article has used, principally ... are the result of the experiences of others ... His own personal observations on the subject were gathered during a sojourn of about twelve years among several of the different tribes of Alaskan natives, during which time he never discovered among them a single true case of carcinosis ...

“In the nearly twelve years which the writer of this article spent in Alaska, during which he came into contact with many of the different tribes of the natives living there (although not all), he never found a true case of cancer among the full-bloods and but very few among those of mixed blood. The food of these people consists almost exclusively of fish and some shell fish, with cereals, berries and some vegetables ...

“... the writer feels that the conclusion can be safely drawn that to civilization and all its influences may be attributed in a very large measure ... the increase in frequency of malignancy among primitive races.”

At Valdez, where Dr. J. Lyman Bulkley practiced medicine for a decade following 1900, we come westbound to the forest Indians and coastal Eskimos among whom Dr. Joseph H. Romig practiced medicine through more than forty-four years, from 1896 past 1940.

In his later decades, especially after the government built the railway north from Seward through Anchorage to Fairbanks, and after Dr. Romig became primarily a railway employee, his practice embraced a racially still more conglomerate group — whites, non-white immigrants, forest Indians, and Eskimos. From this angle, to emphasize the Athapaska-Indian and Tlingit-Indian connection, I quote again the extract from the 1933 interview of Dr. Weston A. Price with Dr. Romig, taking the liberty to italicize the word *Indian* by which *forest Indian* is meant.

“Romig, a surgeon of great skill and with an experience among the Eskimos and *Indians*, both the

primitive and modernized ... stated that in thirty-six years of contact with these people he had never seen a case of malignant disease among the truly primitive Eskimos and *Indians*, although it frequently occurs when they become modernized.”

Let us now move northward along the Bering Sea coast to the northern or Yukon River edge of the Romig territory. From the sea we go 200 miles up the Yukon, easterly, to the Episcopalian mission of Anvik, which, overland, is only 75 miles from the salt water of Norton Sound. It is a wooded country whose forest Indians have long been friendly with the Eskimos of the treeless coast. Here lived, in his youth, the informant whom I have already summoned as a character witness for Dr. Romig, the present rector of St. Peter's-by-the-Sea, of Sitka, the Reverend Henry H. Chapman. To quote further:

“I remember one elderly man, a full-blooded [Athapaska] Indian, who had a growth on his lip that was suspected of being cancerous. I understand that he was examined by a traveling physician who was passing through Anvik. I do not know what the doctor's diagnosis was. I do know that the man lived to a good old age, and that until comparatively recent times he was the only Indian in that area who was even suspected of having cancer ...”

In reply to a further query, the rector wrote again from Sitka on September 16, 1958. He confirmed that he had lived at Anvik all but three of the years between his birth in 1895 and his first journey in 1908 when he went out to become a graduate of Middlebury College, Vermont. “I returned to Anvik as a missionary in 1922 and lived there until 1948, except for furloughs and the four years I was in Fairbanks.

“The native people of the Anvik area are Athapaskans. During my youth the main parts of their food were meat (caribou, rabbits, grouse, waterfowl, beaver, porcupine, black bear and lynx) and fish (salmon, whitefish, shellfish, loche and lampreys). The loche has a large liver which is said to be even richer in vitamins than ordinary cod liver. The Indians also ate raw foods such as berries, wild rhubarb, and a root which they called ‘mouseberries’ because it was gathered and hoarded by field mice.

“They obtained fat from caribou, black bear, and beaver tails. The lampreys were rich in oil, which was highly prized. They also bought seal oil from the Eskimos. Even in my boyhood they supplemented their native diet with white man's food, including lard ...

“The usual way of cooking meat was either boiling or frying. As a boy I was once invited by a party of Indians to eat bear meat with them. It was boiled and well done ... I do not know that any flesh foods were eaten raw, except for dried fish ...”

Neither does the published literature on the forest Indians report that any flesh foods were customarily eaten raw by the forest Indians of Alaska or northern Canada. Indeed, the name “Eskimos” is believed by many to have been derived from an Algonquin expression meaning “they eat their meat raw.”

When I went down north along the Mackenzie, in 1906 and 1908, I now and then heard talk of how horrified the Athapaskans had been when they first saw white men of the Northwest Company and Hudson's Bay Company eating the customary British underdone roast meats. In 1910, when we met

the Athapaskans northeast of Great Bear Lake — Dogribs, Slaves, and Yellowknives — we found that they were still mildly horrified to see the Hudson's Bay Company Canadian Joseph Hodgson and the Old Country British John Hornby and Cosmo Melvil, who were then living among them, eating rare caribou steaks and roasts.

In a presentation of evidence regarding the views of frontier doctors on the incidence of cancer, it is of consequence to make clear that early testimony regarding the rarity or absence of malignancies is as clear and strong for the forest Indian north as for the grassland Eskimo country. Some of the early medical missionaries — notably Dr. Hutton in Labrador — have inclined to credit a diet of raw flesh with that former absence of cancer in which they believed. To emphasize this point let me quote again Dr. Hutton's book *Health Conditions* (1925), Page 35:

“Some diseases common in Europe have not come under my notice ... Of these diseases the most striking is cancer ... In this connection it may be noted that cookery holds a very secondary place in the preparation of food — most of the food is eaten raw ...”

If only Eskimos are considered, in relation to the alleged former absence of cancer, and of these only the Labradorians, then the logical deduction for one who believes nutrition to be fundamental in relation to malignancy, is that actual rawness of food may be the crucially important cancer-inhibiting factor. But the force of this logic diminishes as we go westward from Labrador, among the Eskimos. Without cancer's appearing at all, cooking grows steadily more important as we move west. From Dr. Hutton's and other accounts, the Labradorians, east of Hudson Bay, were the greatest raw-flesh eaters of the whole Eskimo world. West of the Bay the boiling of flesh increases; and inland from the Bay, among the Caribou Eskimos, the roasting of caribou supplements the boiling. At Coronation Gulf, near where Dr. Jenness and I spent the first years during which the Copper Eskimos ever associated closely with Europeans, the years 1910 to 1915, there was considerable summer use of roasting, though the winter cooking, if any, was by boiling. Among the Mackenzie Eskimos, as described from the 1860's by Father Emile Petitot and from the early 1900's by myself, boiling and roasting were both considerable. These methods were even a bit more common in northern Alaska, as described by John Simpson in the 1850's and Murdoch in the 1880's. In southwestern Alaska as described by Dr. Romig in the manuscript he submitted to our *Encyclopedia Antarctica*, for the last decade of the nineteenth century and the first one of the twentieth, the cooking of flesh foods reached its Eskimo high point.

Yet the mission testimony, starting from Labrador, remains equally clear, from east to west: the medical missionaries all looked for cancer, and they never found it among the “primitive,” though they did find it among the “modernized.”

Thus clarification is important for whoever expects a nutritional key to this Eskimo cancer situation. Among the Athapaska and western Eskimos cooking was hardly ever carried to the point of “well done,” or “boiled to pieces.” Instead the native meats resembled our fashionable roasts, which have a well-done layer on the outside, medium done just under that, and the center pink or red. And so it was with the forest Indians — at least with those Athapaskans from Great Bear Lake to just west of the Mackenzie, with whom I hunted and lived — though they insisted on some cooking, they were in practice as careful as Eskimo cooks to see that the centers of most pieces were pink.

To sum up the raw and cooked-food elements of northern medical missionary theorizing about cancer:

During the time when large numbers of non-Europeanized northern natives were allegedly free of cancer, there was little cooking of flesh foods beyond the degree which we call medium. Among grassland and coastal Eskimos raw flesh eating ranged from a great deal in northern Labrador to a good deal in southwestern Alaska. Only among forest Indians were raw flesh foods avoided, and even among these there was little use of overcooked flesh.

Vegetable foods, where eaten at all, were always raw, among prairie and woodland natives alike. Among Eskimos, vegetable foods were important only in the farthest west — along the west coast of Alaska, among the Aleutians, and along the south coast of Alaska. In the most northerly region from Baffin Island, Canada, to Point Barrow, Alaska, vegetable eating was negligible, except in time of famine. Among woodland Indians, vegetables were negligible with the Athapaskans from the west shore of Hudson Bay to beyond the Mackenzie. In Alaska the eating of raw vegetables by forest Indians increased westward along the northern belt and then increased still more southward, into the country of the Tlingit.

During the time when the medical missionaries reported cancer difficult or impossible to find among large numbers of primitive natives, there was no usual cooking of any vegetables, whether among grassland or forest natives. The cooking of vegetables is part of that Europeanization which is considered by some missionaries to be responsible for the introduction of cancer, or for the change from its being hard to find to its being impossible not to notice.

The European-style application of intense heat to food through frying was new to all northern North American natives.

9. The First Native Cancer Is Recognized In Northern Alaska

After forty-nine years of the search which Leavitt began in 1884, cancer in a north Alaska native was first identified at the Farthest North Hospital of the Presbyterian medical mission to Barrow in 1933.

During my own middle years, between ceasing northern field work in 1918 to becoming like everybody engrossed with World War II, my interest in the special problem of cancer on the northern Alaska-Canada frontier was mainly quiescent, though with active periods. My preoccupations during those years were study and writing, mostly in connection with the North; my base of operations was New York City, because of its great libraries. A visitor, every three to four years, was Charlie Brower who had been Leavitt's buddy at Cape Lisburne, northwestern Alaska, when his cancer search began. Brower had in 1885 moved 300 miles northeast to establish at Barrow the "station" for whaling and trading. This post became the focal point of northern Alaska for whaling ships that passed going east or west, and for revenue cutters, explorers, and natives.

Brower had many friends in New York, Connecticut, and New Jersey. He was a native New Yorker himself and his father had become mayor of a New Jersey town. It was Charlie's occasional visits to friends and relatives that kept reawakening my interest in cancer. When I saw him we kept reminiscing about Leavitt and about the various polar expeditions which had fraternized at Barrow with revenue cutters, whaling ships, missionaries, and natives.

One of these expeditions had been my own Anglo-American Polar; and Brower had been involved when the Barrow medical missionary, and the surgeon of the cutter *Thetis*, told our surgeon of their belief that the Eskimos of northern Alaska had suffered no cancer, at least not since they first became continuously known to the Yankee whalers following 1884. So, on his visits to New York, Brower would seldom fail to mention cancer in one connection or another, always saying its existence among natives farther south in Alaska kept being reported, but that as yet this was mere hearsay to northern Alaska.

On one of his visits, however, Brower said the time of mere hearsay knowledge had passed. A Barrow Eskimo had been struck down with cancer, a man I knew slightly through having met him several times during my visits there of 1908 to 1912.

Apart from what I heard from Brower, my interest in cancer now remained dormant until 1935 when I signed a contract with the War Department to gather, to supply from my own knowledge, and to formulate for presentation to them whatever I thought might prove useful information. To me it seemed obvious that on conditions of Alaskan health and disease the department needed information and understanding. So one thing I did was to follow up Brower's report of the eventual identification of cancer at Barrow (after such a long vain search) by seeking medical details from Dr. Henry W. Greist, who in 1921 had taken over the post Dr. Marsh had held in my time as head of the Presbyterian hospital, now known as Farthest North Hospital.

Unfortunately my 1935 letter to Dr. Greist proved to have been equivocally worded. Still more unfortunately I rushed into print the supposed facts I got in reply. My fault, which I did not realize until 1957, was that I did not ask Dr. Greist for general information about malignant disease, but

instead told him Brower's story and asked for medical comment on that story specifically. The result appears in my War Department *Arctic Manual*, Washington, D.C.: Government Printing Office, 1940, pages 308-9:

“Cancer has not yet been reported from uncivilized Eskimos. One death from cancer has been reported at Barrow of a man who had been working for and with Mr. Charles D. Brower for nearly 40 years and living to a considerable extent on European food. However, an inquiry from Dr. Greist, medical missionary at Barrow, brings an answer which casts doubt on the diagnosis.”

Dr. Greist's reply to my letter was to the effect that the man I asked about had not died in hospital, that there had been no post mortem, and that the cause of death was unknown. Thus it was not until 1957, some twenty-two years later, that I discovered I had failed to get the information I needed, because I had asked a loaded question and the doctor had answered me literally. I had asked whether a certain specified man had died of cancer and the answer I got was that, in this specified case, the cause of death was unknown. Meantime it was known to Dr. Greist that another Eskimo had died of cancer. From the records of his hospital it is apparent that a cancer patient died there of the disease on July 27, 1933.

Because this was the first known malignancy death in northern Alaska, occurring forty-nine years after Leavitt began his search on the north coast, I shall set down all the details of which I feel sure.

When I took up again those inquiries which led to the writing of this book, an early step was to attempt to revive my correspondence with Dr. Greist, who had resigned his medical missionary position in 1936 and retired to his Indiana home at 318 North Bluff Street, Monticello. The reply came from Mrs. Greist, for her husband had died two years before.

In a letter dated February 19, 1957, Mrs. Greist explains that she remembers nothing of a disagreement between her husband and Mr. Brower on the cause of anybody's death, and suggests that if there was such a dispute it would be outside her sphere unless the man died in hospital or unless for some reason there was a post mortem, at which, in her capacity as head nurse, she would have assisted or at least have been told about it. Then Mrs. Greist continues:

“... I do remember nursing a case of cancer of the liver of an old man who came to Barrow from far to the eastward. After a week or two he died and Dr. Greist and I held a post mortem. We were then satisfied it was cancer ...”

This was all Mrs. Greist was able to say from memory, except that northern Alaska's first identified cancer illness and death came during some year early in the 1930's. But when she learned that her testimony was intended for publication, along with other testimonies, she instituted a search and finally discovered precise dates for this case. She wrote me on August 30, 1958:

“After three days and late nights reading through three years of my diary that I kept in the North, I found what you wish to know about the cancer case. On July 27, 1933, at 7:45 A.M. Jobe passed. I have recorded the fact that Lee, Helen and I helped Dr. Greist with the autopsy. [We found] an immense cancer of the liver; we guessed the weight at 25 or 30 pounds ... Helen is dead; Lee should remember [the cancer victim's] full [Eskimo] name... Lee is head of the native store at Barrow now.”

Mrs. Greist followed up this second letter by lending me a handwritten diary dating from January 1, 1933, to December 31 of that year. Into this she has freshly written, opposite the entry for July 5: "The day Jobe came in." The entry says: "Jobe came in with obstruction of the bowels; very bad shape."

The diary for July 17 says: "Old Jobe much worse; going to die ... Up on duty till 4:00 A.M., did not sleep till 4:30."

In a further recent entry Mrs. Greist indicates on the margin for July 27 that here is the crucial passage of her informal, private diary. Insofar as applicable the passage reads:

"Helen came and called me at 3:00 A.M. as she thought Jobe was passing ... but he did not die until 7:45 A.M. Both girls were very sleepy so we let them sleep ... Worked all day; cleaned some in the operating room and clinic. Helped Dr. with the autopsy on Jobe (Helen, Lee and I). An immense cancer of the liver ... it must have weighed 25 to 30 pounds. Helen and I washed and dressed Jobe for burial."

Apart from assuring me that this was the first case known to herself, or to Dr. Greist, of death from cancer by an Eskimo native from the north coast of Alaska, Mrs. Greist had little pertinent information on the case of Jobe. He was an elderly man. Whether he had worked on shipboard (thus living a good deal European style) she cannot say. In a general way it is known that all natives along this coast were eating some white man's food at most of their meals after 1913; see, for instance, the descriptions of typical meals by Dr. Diamond Jenness in his *Dawn in Arctic Alaska* (University of Minnesota Press, 1957). The book was compiled from the notes Dr. Jenness kept while he was anthropologist of our third expedition, the Canadian Arctic Expedition of 1913-18. See also my own writings about the coast east of Point Barrow for the years 1906-14. (In view of the idea of some, that the application of extreme heat to food is carcinogenic, it might be noted that a chief European food item around 1910-30 was fried bread — doughnuts, crullers — cooked in exceedingly hot seal oil).

Toward the end of her first letter to me, the one dated February 19, 1957, having dealt already with the case of Jobe, Mrs. Greist goes on to discuss a form of cancer that is frequent among whites in Europe and North America, breast cancer in women. The letter says:

"This I know, we never found any women with lumps in their breasts. I never knew, in all my 17 years of nursing in the hospital with Dr. Greist, of a single woman who did not breast-feed her child, and nurse it for 2, 3, and up to 4 years ... I never observed a caked breast or a sore nipple."

Mrs. Greist, who herself had ceased northern nursing in 1936, advised me to get in touch with a nurse whom the government had sent to help take over the Farthest North Hospital's work when it was transferred by the Presbyterian Church to the Department of the Interior. Mrs. Greist had been deeply impressed with Miss Mildred H. Keaton, both as to her professional training and as to her long and varied experience as a dog team and airplane nurse who was thoroughly familiar with the native situation at the western end of northern Alaska (at the Kotzebue Government hospital, just east of Bering Strait and just north of the Arctic Circle). From there eastward, Miss Keaton had again and again traversed a thousand miles of coast beyond Barrow to the Canadian border.

Miss Keaton replied to my letter on April 15, 1957, from her new post at the White Pass and Yukon

Route Hospital, Skagway, Alaska:

“Regarding the absence of cancer from the pre-white Eskimos of arctic Alaska, it has ever been a source of wonder to me that during the fifteen years when I was a field nurse in the Kotzebue and Barrow districts, going east of Barrow to Demarcation Point [on the Canadian boundary], among the more primitive Eskimos, only once did I come in contact with a diagnosed case of cancer ...” (In later correspondence Miss Keaton said this lone case seen by herself was in the middle 1930's, thus two or three years after the above Greist autopsy and cancer identification at Barrow.)

“We field nurses have often wondered why the women did not have breast cancer, due to the way they carried their babies on their backs with a strong leather or reindeer skin belt fastened tightly around their chest ... the pressure on the mammary glands of the breasts must have been severe.

“The late Dr. Ray Edward Smith was hospital physician in Kotzebue for some 16 years ... [serving] a population of native people totaling about three thousand coming to Kotzebue Hospital. He once told me he had always been most pleasantly surprised at the absence of cancer of any kind among these people.”

If Miss Keaton is right about the figure 3,000 for the clients of Kotzebue Hospital, she herself must have served a total of more than 5,000 Eskimos each year during the fifteen years when she shuttled, by dog team and plane, between Kotzebue Sound and the Canadian boundary.

Miss Keaton advised us to get in touch with the widow of Dr. Smith, a trained nurse, to check her [Miss Keaton's] report on Dr. Smith's views. Mrs. Marguerite Smith answered on July 19, 1957, from 803 Fourth Avenue, Puyallup, Washington:

“It has long been my wish that Dr. Smith's observations concerning the incidence of cancer ... be made known ... I was with him after 1936, and many times he remarked that he had never encountered cancer among the natives (Eskimos) prior to that time. During the time I was in Kotzebue, 1936-41, we had only two malignancies, one in 1938, the second I believe in 1940 ... Both patients were in their late fifties ...

“Since leaving the hospital, I personally know of two women in their thirties who have died from cancer of the cervix ... Both had acquired the white man's way of living. During the time I was there I believe there were on the average one or two cases of non-native cancer per year ...”

Dr. Thomas Marcom, formerly of northwestern Alaska, wrote from 327 Wesley Gardens, Des Moines, Washington, on January 11, 1958:

“My experience in Nome covered the years from 1936 to 1946, during which time I was privileged to see a large portion of the Eskimo population in Nome and surrounding areas, including the coast, the interior, the Diomedes, King and St. Lawrence Islands. I know of only one case of cancer ... of the penis which had been operated upon by Dr. Rex Swartz, my predecessor. I followed the case for about eight years. The man died at an age beyond 70. I diagnosed no case.”

Nome, though it was a prosperous district for a decade or two after 1900, has not shared much in

recent Alaska prosperity. Consequently most natives, between the Yukon delta and Point Hope, still live mainly on fish and game which they themselves secure.

Dr. L. A. White of 642 Eugene Medical Center, Eugene, Oregon, wrote me on February 21, 1958:

“... It has been almost 17 years since I practiced in Alaska. I was at Unalaska [Aleutian Islands] 1934-48, having previously spent 17 months at Metlakatla [Alaska Panhandle], then several months in '39 at Klawock [Panhandle]; finally one and a half years at Bethel [Lower Kuskokwim]. My work led me to these conclusions: (1) hypertensive and arteriosclerotic diseases were practically nonexistent among the native peoples; (2) diabetes was extremely rare; (3) malignant disease was extremely rare — in fact, I had only one proven case (Bethel, 1940). I saw no strokes nor coronary heart disease ...”

10. Cancer Is Discovered Among Labrador Eskimos

This book, as a review of northern frontier evidence on malignant disease, requires two sections about Labrador. Chapter 6 covered nearly 200 years from the 1752 start of Moravian mission activity to the publication in 1925 of the book *Health Conditions and Disease Incidence among the Eskimos of Labrador* by Dr. Samuel King Hutton. The present chapter will deal with the first report of native cancer there in 1935, and with the increasing frequency of reports since then, down to 1957. For the allegedly cancer-free centuries I depend chiefly on the personal observations of Dr. Hutton and on his study of Moravian health records. For the admittedly cancerous recent time I depend mainly on letters and other manuscript information from Superintendent the Reverend F. W. Peacock, whom correspondence reaches at Happy Valley, Labrador, Province of Newfoundland — as indeed letters will reach Dr. Hutton at the chief British mission base for Labrador of the Moravian Church, London, England.

It is the view of most of the medical missionaries I have cited, from Dr. Albert Schweitzer in Africa to Dr. Joseph Romig in Alaska, that cancer is a disease of the civilized. It is therefore necessary to consider this question: In what sense had the Moravian Eskimos of Labrador become civilized between their giving full allegiance to Christianity around 1804 and the appearance in 1925 of Dr. Hutton's book reporting failure in his search for cancer; and in what sense, if any, are the Labrador Eskimos more civilized, now that malignant disease has come to be as frequently reported from among them as it is from among the French of Paris or the English of London?

Civilization, as reflected in the Europeanization of diet, has been pictured in the earlier Labrador chapter and will be elaborated here. To some extent housing and clothing will also be considered. Dr. Hutton and Superintendent Peacock have separately reported on civilization as reflected by book learning and social change, Hutton in his book, *Among the Eskimos of Labrador* (1912) and Peacock in a Master of Arts thesis on the sociology of Labrador. I shall not use these reports, however, in the following discussion, for their essence is condensed in an even more readily available source, *Labrador: The Country and the People*, by Wilfred T. Grenfell and others (London and New York, 1909). For sidelights on the Moravians the time of the Grenfell publication is just right, since 1909 falls within the period 1902-13 which Hutton particularly describes. This book's chief author, Sir Wilfred Grenfell, M.D., was himself a medical missionary serving a white community adjoining the Moravian Eskimo district and overlapping it somewhat; and among Grenfell's co-authors was Dr. William Stewart Wallace, one of Canada's foremost historians, for many years editor of the Champlain Society's magnificent series of frontier publications and now librarian emeritus of Toronto University.

In a historical introduction, Dr. Wallace mentions Scandinavian contacts with the Eskimos of Labrador around A.D. 1000 and sketching the history of the region beginning with John Cabot in 1498, Dr. Wallace says, "There remains to be told the story of the Moravian missionaries. No more wonderful story of missionary effort has ever awaited the pen of the reporter; and yet the work of the Moravian Mission in Labrador has been little known. It was in 1752 that the United Society of Brethren first attempted to found a mission among the Eskimos. It ended in failure." Wallace then tells of the attempts to establish a permanent mission which were finally successful in 1771.

“In 1773 the British government sent out Lieutenant Curtis, R.N., as a commissioner to report on the progress of the mission. Some sentences from this report may be transcribed: ‘... Their house is called Nain ... They have a few swivels mounted, although they have no occasion for them, as the Indians [Eskimos] are awed more by their amiable conduct than by arms ... The natives love and respect them ... The progress which the mission has made in civilizing the Indians is wonderful’.

“... Everything, however, did not go smoothly at first. About 1787 a mysterious person named Makko, a French Canadian (says the historian of the mission), who combined the character of a merchant and Roman Catholic priest, succeeded in enticing a number of the Eskimos away from the Brethren ... It was not until 1804, says one of the missionaries, that the fruits of the mission began to appear.”

What those fruits were, Dr. Grenfell reports as an Anglican and as a medical missionary serving the primarily English settlers of the Labrador territory adjoining that of the Moravian Eskimos. This viewpoint is apparent throughout the book but especially in the chapter “The People of the Coast.” Speaking of Labrador as politically belonging to Newfoundland, Grenfell says:

“Education in both Newfoundland and Labrador is another very difficult problem. It is rendered almost impossible to solve owing to the denominational system of schools. A recent visitor, writing in an American paper, expresses himself as follows, and his views I entirely agree with:

“... The island is a poor and sparsely settled country; yet its education is completely in the hands of the churches ... In the smaller settlements there may be a Methodist, an Anglican, a Roman Catholic, and even a Salvation Army separate school ... This is the logical outcome of the denominational idea. It ... bids fair to postpone forever any real unification of the people.”

But this denominationalism did not greatly interfere with the Moravians, who, according to Grenfell, served around 1909 some 1,300 Eskimos out of a total Labrador white and native population of about 4,000, most of the whites being of English descent. Says Grenfell:

“The best educated people in the country at present are the Eskimos. Almost without exception they can read and write. Many can play musical instruments, and know the value of things. These accomplishments, entirely and solely due to the Moravian missionaries, have largely helped them to hold their own in trade, a faculty for want of which almost every aboriginal race is apt to suffer so severely.

“I have known an Eskimo called in to read and to write a letter for a Newfoundland fisherman, and I have had more than once to ask one to help me by playing our own harmonium for us at a service, because not one of a large [white] audience could do so. I have heard more than one Eskimo stand up and deliver an excellent impromptu speech.

“Reading the [government's] Newfoundland Blue Books, reporting the numbers able to read and write in Labrador, I acquired an entirely erroneous estimate of the peoples accomplishments in those directions. Our white population is still very illiterate. Some headway has, however, been made in late years, and literature and loan libraries distributed through the Labrador Mission are now accessible along the coast, and are creating [among the English-descended residents] a love for reading.”

Like practically all writers on the Labrador of the last hundred years, Grenfell is worried by the inroads of European disease among the native population. “The sicknesses of the coast are not indigenous. In the past seventeen years there have been grippe; a few cases of small-pox imported by a schooner from the Gulf [of St. Lawrence]; scarlet fever brought from Newfoundland by a steamer; one small outbreak of diphtheria in the Straits on the arrival of the summer visitors; and in the summer a few sporadic cases of typhoid.

“The Eskimos brought back from the Chicago Exposition [of 1893, where they were exhibited] typhoid of a very virulent type which killed several hundred of them; and, from the Buffalo Exposition [where they were also exhibited], diphtheria, which is still [in 1909] raging amongst them and has destroyed many. An epidemic of grippe ... killed sixty in the neighborhood of Okkak. The worst enemy of the Eskimo is, again, tuberculosis and from that, in one form or another, most of the people die ... On the other hand, so healthful is the country that I have no hesitation recommending it for neurotics, or even to persons with a disposition for tuberculosis.”

In a chapter recommending the reindeer industry to Labrador, Dr. Grenfell confirms Dr. Hutton on the poor nourishment of white Labrador babies (in contrast with the good nourishment of Eskimo babies of the time). Dr. Grenfell wants reindeer meat and milk especially for these European babies that suffer from “rickets, scurvy, multiple neuritis, blindness from corneal ulceration, and other diseases of insufficient nourishment rife among a people enjoying a bracing pure air, undefiled by human or other exhalations, and in a country entirely free of endemic diseases ... We were wont to see ill-fed mothers, without milk to suckle their babies, chewing hard bread and thus, after predigesting it in their mouths, trying to maintain life in their wizened offspring ...”

In relation to the seal-meat-eating Eskimos just north of his own white and forest Indian mission field, Dr. Grenfell makes no reference to cancer, perhaps because he agreed with the Moravians, and the rest of the medical missionaries of the northern frontier, that malignant diseases were not to be expected among primitive peoples. This reticence on cancer holds for his account of a visit in 1905 to the Moravian missions north of him. (The following pertinent quotations are taken from the 1922 revised edition of *Labrador*.)

“At present the Moravians have flour stations. The most northerly ... is Cape Chidley. Here the Eskimos, attracted by the excellent seal-fishery, have gathered from the northeast coast and from Ungava Bay ... The missionary in charge at present is a splendid specimen of humanity ... One leaves the station regretting that so few should be there to benefit, humble and glad that men of such type still live to adorn the human race.”

About a hundred miles to the southeast Grenfell passed an Eskimo settlement that he did not so much admire — for special reasons, among which was the fact that these people were “much more dependent upon the missionary, upon his supply of [European] clothing, and upon his European food, than [was] good for them.”

Another hundred miles to the southeast brought Grenfell to Hebron. “Its Eskimos have been wisely taught by the Brethren to segregate and not congregate ... This would be today probably the most creditable settlement of the Eskimos, had it not been for the carrying of several families to show them to the curious at the Exhibitions at Chicago, Buffalo and elsewhere. Few returned, and they richer

only in those heirlooms of civilization, the germs of specific diseases, which most effectively put a stop to the growth of the community and left a diseased and miserable people, to be a constant danger” to the rest of the Eskimos.

About 40 miles south of Hebron, Grenfell reached Okkak, the largest of the Moravian stations. “It is within the northern limit of trees ... the annual census shows that during the fifty years previous to 1902 the congregation was steadily growing ... This station was entirely blotted out in 1919 by Spanish Influenza. Out of 365 Eskimos 300 perished, including every single adult male ... when Nain was destroyed by fire in 1921 a large portion of that congregation returned to reopen Okkak.”

At the southward end of his journey, as he approached his own mission some ninety miles south of Okkak, Dr. Grenfell found “Nain, the fifth station ... [It] is at once the head station of the Brethren, the seat of the Bishop, who is also a German consul, and is of the oldest standing. Its well-tended vegetable patches, the tidy paths through the woods ... The prim flower garden, and the orthodox tea house ... combine to transport the visitor momentarily to German homes which these good men have left, never to return ...

“This station is the head of the trade, too. For the mission is an industrial one; and therein, to my mind, lies its immense value. It not only tends to the mind and spirit, but it looks after the ‘vile body.’ Had it not been so for the last one hundred and fifty years, there would now be no bodies through which to get at souls. There can be no question the Moravians have so far saved the native population for Labrador. The more numerous Eskimos that once flourished between Hopedale, their southernmost Eskimo station, and Anticosti Island, are gone almost to a single man. Eskimos once were numerous on both sides of the strait of Belle Isle. At Battle and at Cartwright in 1800 they were numerous. Contact with white men has blotted them out like chalk from a blackboard ...

“The casual reporter visiting Labrador has more than once severely criticised the trade methods of the Brethren ... They have been stigmatized as robbers and oppressors. Indeed they have been so misunderstood that their Conference has seriously considered abandoning their trading altogether. Were they to do so, there would in a very brief time be no need for their spiritual ministrations ... They look after the poor, feed the infirm and helpless, tend the sick, educate the children ...

“Some ninety miles south again is Hopedale, the sixth station. It is the southern boundary of the tribe now, and one cannot visit the station without feeling forcibly that the fringe is ravelling out, and that the race in Labrador is facing its inevitable doom ...”

This “inevitable doom” must have seemed even blacker to the Moravian medical missionaries who had dreamed it could be staved off indefinitely by avoiding the Europeanization of the food — by inducing healthy people to remain healthy through continuing to eat the raw foods which they loved and which they could secure in ample quantity from their own land and waters.

Ruefully Superintendent Peacock admits that the best they were able to do was to slow up Europeanization by a few generations. Among the first subversive influences, tending toward eventual dependence on the white man, was the fact that the Eskimos contracted first the tobacco habit and then the tea habit. Thereafter followed gradually the use of bread, salt, and sugar; then came increased cooking and the use of hot drinks. Still it was possible as late as the period 1902-13 for Dr. Hutton to

conclude from his own observation that “cooking holds a very secondary place in the preparation of food.”

While he makes this observation on cooking as part of a suggested explanation as to why he could find no hearsay or other sign of cancer among the Labrador Eskimos, Dr. Hutton also makes, elsewhere, the general observations on the health of the Labrador Eskimo that “... his muscles are rested by a shorter period of sleep than is customary among civilized peoples. Men and women alike show the power of withstanding fatigue.” So long as their diet continued to consist exclusively of their own fresh foods, hardly cooked or raw, their robust health broke down only when they were exposed to European diseases against which they had no inherited immunity, such as the deadly measles and the almost equally deadly tuberculosis. But on the Europeanized diet they became prey to a swarm of other new diseases.

In a letter of December 11, 1957, Superintendent Peacock says of his predecessor, the Reverend Paul Hettasch (who came to Labrador in 1898, thus four years ahead of Dr. Hutton) that he “was deeply interested in things medical. Although he had had but a short medical course, he was a competent doctor and surgeon (minor), a very keen observer ... He ... had little use for the Eskimo who aped the white man ... I believe that Hettasch probably predated Dr. Hutton in his statement that cancer was unknown among the Eskimos. However, the Eskimos had for some time been exposed to a white man's diet when Hettasch came to the coast, although never to the extent they were after the Hudson's Bay Company took over the trade from the Moravian Mission in 1924.” Elsewhere Peacock says that there has been since 1943 a further increase in the Europeanization of the diet, on account of certain policies of the Newfoundland government.

Cancer among Labrador Europeans was, of course, well known to the Moravian mission, both from their own experience and that of the Grenfell mission to the south of them. In his letter of November 20, 1957, Superintendent Peacock says, “Previous to my coming to Labrador, Robert Ford [a Scot who may have had some Eskimo blood] ... died from a diagnosed cancer ...”

In the aforementioned letter of November 20, Superintendent Peacock reports what he believes to have been the first death of a Labrador Eskimo from a recognized cancer:

“When I first came to Labrador, in 1935, I was told [by the Reverend W. Perrett] that cancer never occurred among Eskimos. However, during the winter of 1935-26 an Eskimo, Michael Nochasak, became ill with abdominal trouble ... This man suffered intense pain and was removed to a hospital when navigation opened, and died of cancer.

“In 1936 I went to Nain from Hopedale and was again told, by the late Reverend Paul Hettasch, that cancer was unknown among the Eskimos. But during the following winter, 1937-38, an Eskimo woman, Leah Ikkusak, became ill, was later transferred to hospital, and returned home in 1940 with inoperable cancer of the womb. [She was the widow of the white man, Robert Ford: who had died of cancer.]

“In 1941 another Eskimo, Amos Martin, died of cancer of the throat. Other cases between 1943 and 1945 in Nain were Boaz Obed, cancer of the stomach, and his wife Rosina, cancer of the womb. Then came Judith White, cancer of the breast (here was successful amputation). Then came two half-breed

brothers, John and Amos Voisey, both of whom died of cancer of the throat and mouth. This was followed by John Samiat, Eskimo, cancer of the throat; then Karoline Kojak in 1955, cancer of the womb and breast. All these cases, with the exception of Nochasak, were at Nain and there were undoubtedly cases on other stations; all died with the exception of Mrs. Kojak who returned from hospital last summer and is still living.”

This paragraph was read in manuscript by Dr. Philip R. White, specialist in vegetable cancers but a general student of malignancy problems. He suggests that the paired junctions are remarkable and should not pass without remark — two men who die of stomach cancer whose respective wives die of womb cancer; and both of a pair of brothers who died of throat cancer. Numerous commentary possibilities rise to mind. However, with the foregoing analysis of the views expressed by northern medical missionaries in mind, it is fairly obvious what their suggestions would be. Believing that cancer is environmental in causation and chiefly nutritional, they would point out that husband and wife almost necessarily live in the same houses and eat the same foods prepared the same way. Like similarity would hold for brothers. So, why should not a nutritional disease be likely to strike these paired individuals within a few years of each other?

In the period during which Superintendent Hettasch believed cancer to have been nonexistent, from the earliest times to 1935, the native population numbered 1,200 or more. Since cancer began to be reported the Eskimo population has numbered about half this figure, varying from 500 to 700.

11. Cancer Is Reported From The Canadian Eastern Arctic

Among Eskimos, Europeanization has been longest delayed in the Canadian eastern Arctic, that great region which begins on the mainland about 500 miles east of the Mackenzie at Dolphin and Union Strait and extends to Hudson Bay. There, in Coronation Gulf and Victoria Island, our second expedition, the one of 1908-12, found more than 500 of what are now called Copper Eskimos, most of whom had never seen a white man. A decade later, in the 1920's, the Danish explorer Knud Rasmussen found on the eastern edge of the Copper Eskimo district about twenty who had missed seeing us, and who told him he was the first white man they had ever seen.

The Copper Eskimos, so named because many of their weapons and tools were of native copper, had never dealt with any traders before 1910. They did not even know tea, used no salt, and lived exclusively on flesh foods, eating roots and such only in time of famine. In 1910, they for the first time tasted sugar, given them by the first trader to reach Coronation Gulf, Joseph Bernard. They disliked it. Ten years later they were beginning to use material amounts of European foods, including both sugar and salt. Farther east, in the same section of arctic Canada, are people who first met whites long ago; but, even including them, the Eskimos of this section still are, with respect to food, the least Europeanized of all North Americans.

A health survey made in 1935, with cancer as one of its focal points is described in an article by the senior investigator of the survey, Dr. I. N. Rabinowitch of Montreal, appearing in the May 1935 issue of *The Canadian Medical Association Journal* (Toronto).

“Two different interests prompted this investigation. The purpose of the Canadian Government was to determine the general health of the Eskimos; whether contact with civilization is causing their deterioration; and, if so, the causes. Quite frankly, this was not the writer's interest ... His interest was primarily in the alleged absence of diabetes, cancer, and arteriosclerosis, and the possible relationship between such absence and the peculiar dietary habits of the people.”

Dr. Rabinowitch found in 1935 that the Eskimos of the northern coastal section of the Canadian eastern Arctic were still living substantially on their native foods, although they were in some places eating enough carbohydrates to materially affect their previously good teeth. Of diabetes and arteriosclerosis he found only slight indication. Of cancer he says on page 493:

“In the western Arctic [from Alaska to Coronation Gulf] Dr. Urquhart has not yet met with a single case of cancer in the seven years of his practice. Cancer must be very rare in the eastern Arctic also. I saw one suspicious case ...” [Dr. Rabinowitch thought it was probably not cancer.]

Chronologically speaking, the next report on cancer for this region is credited to me, on page 171 of Dr. Frederick L. Hoffman's *Cancer and Diet* (Baltimore, 1937) :

“... food surveys of the Arctic region, particularly by Stefansson [in northern Alaska and the Canadian western Arctic] seem to show, regardless of a practically exclusive meat diet, that Eskimos suffer very little from malignant disease ...”

Some thirteen years after the above-mentioned Canadian government expedition a similar medical research expedition was sent into the Canadian eastern Arctic by Queens University of Kingston, Ontario. Their report, as pertains to cancer, is by Drs. Brown, Cronk, and Boag and refers to Dr. Rabinowitch and his “one suspicious case.” I quote from *Cancer*, Journal of the American Cancer Society, Vol. V (1952):

“It is commonly stated that cancer does not occur in the Eskimos, and to our knowledge no case has so far been reported. Rabinowitch (1936) mentions the absence of reports of its occurrence and gives details of a suspicious case ... In August, 1949, the opportunity came to the Queens University Arctic Expedition to carry out an autopsy on an elderly Eskimo man who had died of a wasting illness. Histological study of a mass in the neck has shown carcinomatous tissue. The patient was a pure blooded Iivilik of about 70 years.”

This being a positively identified case, although questioned by a pathologist, and as such the first in the region, it is unfortunate that the authors do not say anything about the way of life of the “pure blooded Iivilik of about 70 years” who is our first known local native malignancy victim. However, the usual diet and way of life of the Iiviliks are well known, *The Indians of Canada* (1932) by Dr. Diamond Jenness being the frequently revised authority. In 1949, the discovery date of this first certified malignancy, Dr. Jenness was the chief Eskimo specialist of the Canadian government. Discussing our region, he says, on pages 421-22 of his 1932 edition:

“The Eskimos of eastern Canada ... have been in contact with Europe for more than two hundred years ... partly from a misguided imitation of Europeans, many Eskimos now wear woolen clothing and even the complete European costume, although their earlier garments of loosely fitting caribou were more picturesque and hygienic, and offered greater protection against the cold.

“Very few Eskimos now hunt intensively during the winter months; instead they trap foxes which are useless to them for either food or clothing. In order to maintain their families during the season they buy European food from the fur traders, largely flour, sugar and tea.”

These paragraphs written around 1930, give an approximate picture of how the first known cancer victim of this district must have been living for some decades prior to his death in 1949.

That the cancer incidence has continued low in the Canadian eastern Arctic — east of Anderson River and west of Labrador — is to be inferred from an article in *The Canadian Medical Association Journal* of Toronto for 1956 (LXXV, 486-88) signed by Drs. Lawson, Saunders, and Cowen, which says:

“For the past 10 years we have been aware of the relative freedom of Eskimos [of the Canadian eastern Arctic] from breast cancer and cystic disease. In spite of strenuous efforts, we have so far been unable to discover one authenticated case of Eskimo breast malignancy.”

Since this statement is restricted to one localized form of malignancy, breast cancer, I arranged through mutual friends to meet, on my next visit to Montreal, Dr. Ray N. Lawson of 4459 Sherbrooke Street West, Montreal 6. He said in conversation, and has more recently said in writing, that he believes most or all other types of malignancy to be as rare as breast cancer, among those Eskimos of

the Canadian Arctic who still depend for the main part of their food on fat and lean seal's meat, cooked moderately or eaten raw. Those whom he investigated, up to the end of 1957, were typically seal hunters, not much dependent on fur trapping, very little dependent on European foods or on European-style cooking.

At first Dr. Lawson's inability to find cancer led him to think that there might be some special immunizing agent in seal's fat, particularly if rancid. However, my understanding later (as of middle 1958) was that while he remains a believer in the general merit of high-fat, low-carbohydrate, little-cooked diets, he is no longer so strongly inclined to believe that seal's fat, fresh or rancid, has any marked anticarcinogenic effect, beyond whatever merit there is in the Stone Age Eskimo way of life as a whole. He feels that "there is something in primitive [Eskimo] diet that protects from malignant disease."

Obviously, from the testimony presented so far, the frontier doctors of Alaska and northern Canada would have expected that statistics, if and when published, would confirm their view that the most civilized parts of northern territories would show the highest cancer incidence.

The chance to test this theory against the facts of statistically adequate population, and for a large and culturally differentiated area, did not come until the U.S. Treasury's *Public Health Reports* for March 2, 1934, carried "Mortality in the Native Races of the Territory of Alaska, with Special Reference to Tuberculosis," by F. S. Fellows, Passed Assistant Surgeon, United States Public Health Service, and Director, Alaska Medical Service.

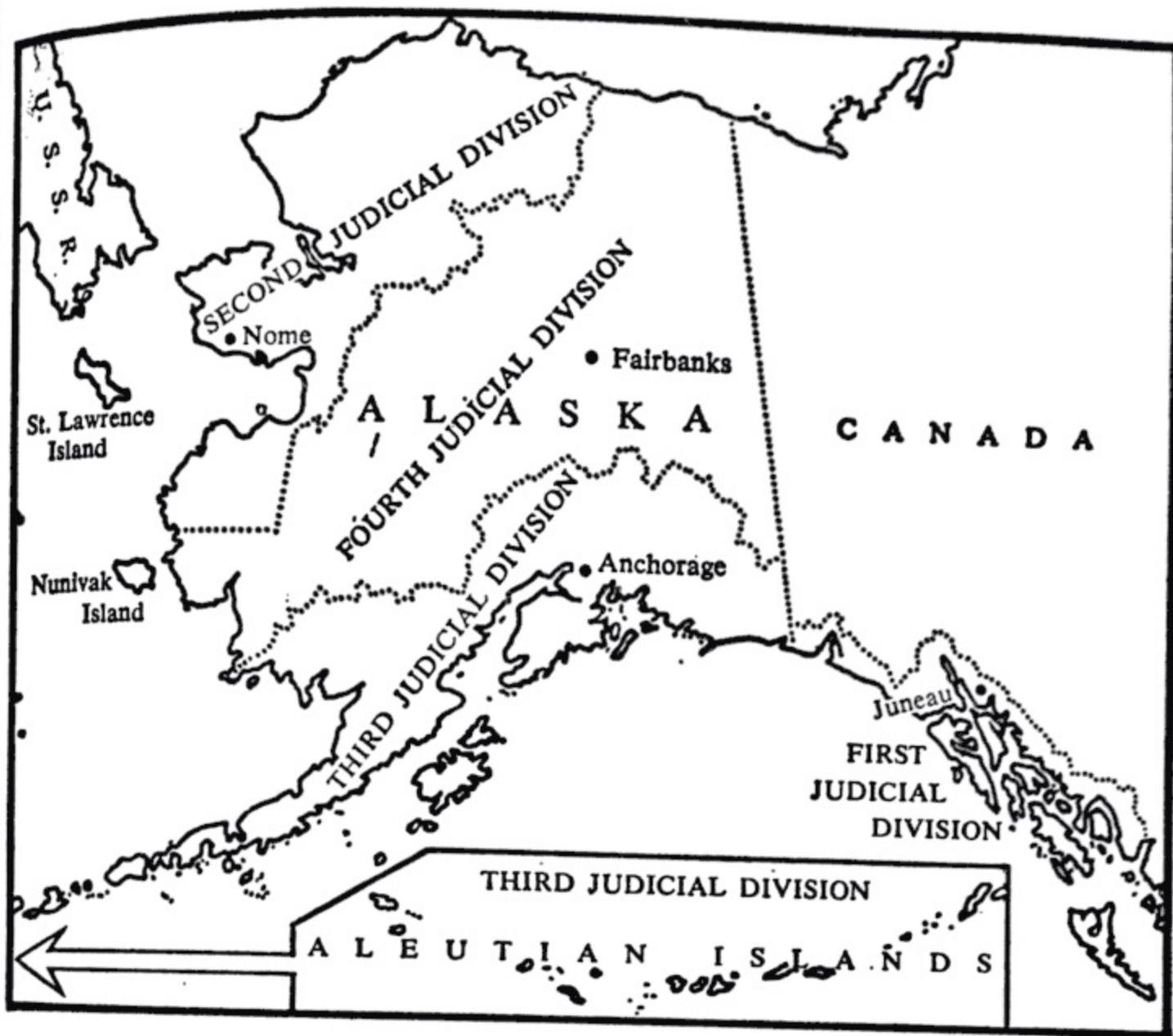
The discussion by Dr. Fellows does have "special reference to tuberculosis." But "malignancy" receives a column in the statistical tables, from which we can readily derive the information we need. The time covered is the five years 1926-30; the population, by the 1930 census, was around 60,000, about evenly divided between natives and whites, thus about 30,000 of each. As to causes of death, Dr. Fellows compares natives with whites and each of the four judicial divisions of Alaska with the other three. For my analysis of his cancer results I shall arrange the divisions in descending order of Europeanization. With an eye on the map (p. 91) and bearing history in mind, we may characterize the judicial divisions as follows:

Most intensively and longest civilized is the *First Judicial Division*, the Panhandle that stretches southeasterly along British Columbia. Its first European contacts were probably with Spain through Mexico in the 1500's. After Bering's voyage in 1741 the capital of Russian America was established at Sitka, where it remained even for some decades after the over-all name was changed to Alaska through purchase by the United States in 1867. Both before and after 1776 Yankee influence was considerable, as was British. After the purchase the influence of San Francisco was at first dominant, until Seattle and Vancouver took over.

Since the forest Indians of the Panhandle have been civilized the longest and most intensively of native Alaskans, the First Judicial Division ought to show the heaviest cancer incidence, according to the views of the frontier doctors whom we have quoted. That is the theory. Let us turn to statistics and seek the facts.

Table 2 of the Fellows paper is entitled "Actual and relative mortality from important causes among

the native Indians and Eskimos and among the white population of Alaska during the five years 1926-30." In the first third of this table, under "Average annual death rate per 100,000," we find in the column marked "Malignancy" that in the First Judicial Division the white deaths from cancer are 92, the native 70. In the middle third of the table, under "Percent of all deaths due to indicated cause," we learn that the white percentage from cancer was 7.8, the native 2.8. In the lowest third of the table, under "Number of deaths," we learn that the whites who died of cancer were 59, the natives 21.



Map showing judicial divisions of Alaska

Historically the *Third Judicial Division* of Alaska ranks second among the divisions in Europeanization. It consists of the Aleutian island chain and of the southwestern corner of the mainland. Russian influence in the islands dates as far back as in the Panhandle, but the mainland part of the division was never intensively Europeanized. By the Tanchou-Le Conte principle, the native cancer rate should be fairly high but not as high as that of the Panhandle. According to Fellows' Table 2, the cancer figure per 100,000 is 75 for whites and 22 for natives; in percentages the whites rate 6.0 and the natives 1.4; in actual cancer deaths the whites have 33 and the natives 8.

The *Second Judicial Division*, from its history, should be in native cancer deaths the next to the lowest of the judicial districts, by the frontier theory. According to the tables of Dr. Fellows the per hundred thousand rate is white 126 to native 14; in percentages it is white 10.8 to native 0.8; in actual deaths the white are 9 to the native 6.

The *Fourth Judicial Division* should be lowest of the four in native cancer deaths. Here the population consists mainly of Athapaskan forest Indians who, except in becoming Christian, have resisted Europeanization much more successfully than either Eskimos or Aleuts, and far more successfully than the natives of the Panhandle.

According to Dr. Fellows the per hundred thousand rate is white 98, native 3; in percentage it is white 8.4, native 0.1; in actual number of cancer deaths the Fourth Judicial has white 27 and native 1.

The medical missionary theorists, those who favor the Tanchou-Le Conte principle, will think that the percentage table (the middle division of Dr. Fellows' Table 2) confirms their belief in most satisfactory fashion. In percentages of all deaths during the five years 1926-30, the cancer rate drops from the highest to the lowest of the districts on the scale as 7.8 to 2.8; 6.0 to 1.4; 10.8 to 0.8; and 8.4 to 0.1.

12. The Tropical Life Of The Polar Eskimos

During 1906 and 1908, when Captain Leavitt and Dr. Marsh were recounting their own failure to discover malignant disease among primitive arctic natives, they told me also they had heard that cancer was equally difficult to find among primitive natives in the tropics.

What, then, did uncivilized natives of arctic and tropical lands have in common, or lack in common, that might account for these corresponding immunities to a particular group of maladies?

The whaler surgeon and medical missionary agreed that no matter what relative immunity the polar and tropical aborigines really possessed in common, the main explanation would likely turn out to be something nutritional, though there might be other contributing factors such as one which had struck both of them: *Neither of these allegedly noncanceriferous groups was ever much exposed to cold.*

This factor of similarity of tropical to arctic primitive living was known to Captain Leavitt from personal experience. When crossing the equator southbound and northbound on Cape Horn voyages from New England to Alaska he had found, as he expected, that uncivilized men of the humid tropics commonly lived naked; and frontier doctors there had told him that cancer was nearly or quite absent. In the arctic lands he had found, contrary to his expectation, that naked living was common also for most of the northern Eskimos through much of the year; and by the time I spoke with him he had been examining thousands of them for decades without seeing or hearing of cancer.

From his own experience, Dr. Marsh agreed with the captain that most north Alaska Eskimos lived through most of the year in the equivalent of humid tropic warmth, and apparently without cancer. From hearsay he agreed, too, about the tropics, this on the basis of what he had read in missionary publications and heard at mission conventions. The information, as he summarized it, I have preserved in memory and in notes; I possess none of it in his writing. I do have the equivalent, however, from another Alaskan source.

The aforementioned Reverend Henry H. Chapman, now rector of St. Peter's-by-the-Sea, Sitka, southeastern Alaska, was born at an Episcopal mission far to the northwest on the lower Yukon. On September 8, 1958, he wrote me a general letter on malignant disease from which I have quoted at greater length elsewhere. One of his paragraphs contains an illustration of how tropical and arctic missionaries can share their opinions with each other:

“In the summer 1929 I attended a conference of missionaries representing several denominations at Hartford, Connecticut. In the course of a conversation with a medical missionary, who had spent many years in the tropics, I remarked on the absence of cancer on the Lower Yukon River. The doctor was greatly interested and said he had observed the same among the natives of tropical Africa. He said it was apparently characteristic of primitive peoples.”

Discussing such things, Leavitt and Marsh told each other and me that an element in any concurrent tropic and arctic freedom from cancer might be the nakedness, the copious sweating, and the resulting thirst, which are natural wherever people are exposed for long periods to heat in the temperature range from 70° to 100° F., and above.

From such discussions came the epigram used at the head of this chapter: “The tropical life of the polar Eskimos.”

Similarly derived is a paradox I have long employed, especially in talks before medical groups: “During winter, the Eskimos lived in homes that were stationary tropics. When they went outdoors they carried tropical warmth around with them inside their clothes.”

In discussing these stationary and portable tropics it is important to note that the characterizations have never applied to Temperate Zone Eskimos like those of Labrador and southern Alaska, or to snow-house dwellers like those arctic Canadians who lived farther east than the Mackenzie group. The most rigorous application of the paradox was to the district Leavitt, Marsh, and I discussed at greatest length, northern Alaska and northwestern Canada; and there it ceased to apply when houses and clothing became Europeanized, following, say, 1910. (For accounts of rigid application, see the books of John Simpson and John Murdoch reviewed in the next chapter, and my own early books listed in the bibliography.)

When we discussed cancer in relation to “the tropical life of the polar Eskimos,” Leavitt's viewpoint was that of the surgeon, and was usually expressed in relation to his own vain search for the disease. He talked of what a convenience it was, when scouting for cancer, especially for breast cancer in women, to find upon entering any winter house that everybody was sitting around stripped to the waist. When I talked with Dr. Marsh, on the other hand, he dwelt upon the rare exposure of Eskimos to chill, their protracted exposure to temperatures above 80° F., their copious sweating, the consequent drinking of much ice water, considering that these things would be likely to affect metabolism and might possibly tend to inhibit cancer.

It should be emphasized that both Captain Leavitt and Dr. Marsh believed the difference between native and European foods to be the main factor behind that increase of cancer which they believed always follows Europeanization. But, since they thought cancer to be a result of disturbed metabolism, they felt that the Eskimos' “tropical” winter life might have a material bearing upon the incidence of the disease.

By the last of my Herschel Island conversations with him, Leavitt had been observing the winters of the Eskimos of northern Alaska and adjacent arctic Canada for twenty-two years. It was he who told me in the autumn of 1906 what to expect if I spent the winter as guest of the not yet civilized people east of the Mackenzie delta as I planned to do. At the time of my last Point Barrow conversation with Dr. Marsh, in 1912, he had been observing the winters of the northern Alaska Eskimos for fifteen years.

But observation can never be quite the same as experience and I think that my own knowledge has come to be more complete than that of my early mentors. For I know how it feels to be an Eskimo. I lived the life which they observed — and I shall now proceed to tell what it seemed like to be an adopted member of an Eskimo group just emerging from their Stone Age.

For reasons which are given in my book *Hunters of the Great North*, I began in September 1906 to

live in modified Eskimo style west of the delta of the Mackenzie River in northwestern arctic Canada. My diary says that about the middle of November the sun disappeared (not to reappear until late the following January). By November I was getting restive; for although the Eskimos of Shingle Point were kind and charming they were too Europeanized. I asked them how far east I would have to go to reach people who had no tea, salt, or sugar, and who still lived approximately as everybody used to live before the whalers began wintering among them (1889).

One of the Shingle Point group, who had been a cabin boy on a whaling ship and spoke fair English, answered me that his cousin Ovayuak, east of the delta, would by now have used up all his tea, and that he abominated both sugar and salt. He should by now have nothing to eat but the fish that were being caught from day to day, unless he had on hand some fat of seal, white whale, or polar bear, to go with the fish. So we headed east from Shingle Point on the morning of December 1. By January 15, 1907, I had been living a month in the home of Ovayuak at Tuktuyaktok, 600 miles east of Point Barrow.

The medical missionary theory, of which Leavitt and Marsh were the chief protagonists, held that nutrition — the kinds of foods eaten and the manner of their preparation — might be the single determinant of cancer incidence; but that nutrition might perhaps be marginally affected by elements like sweating, water drinking, and the comforts and amenities of Eskimo life — such as the friendliness of house mates, the conversation, the singing, the useful work in which we all shared.

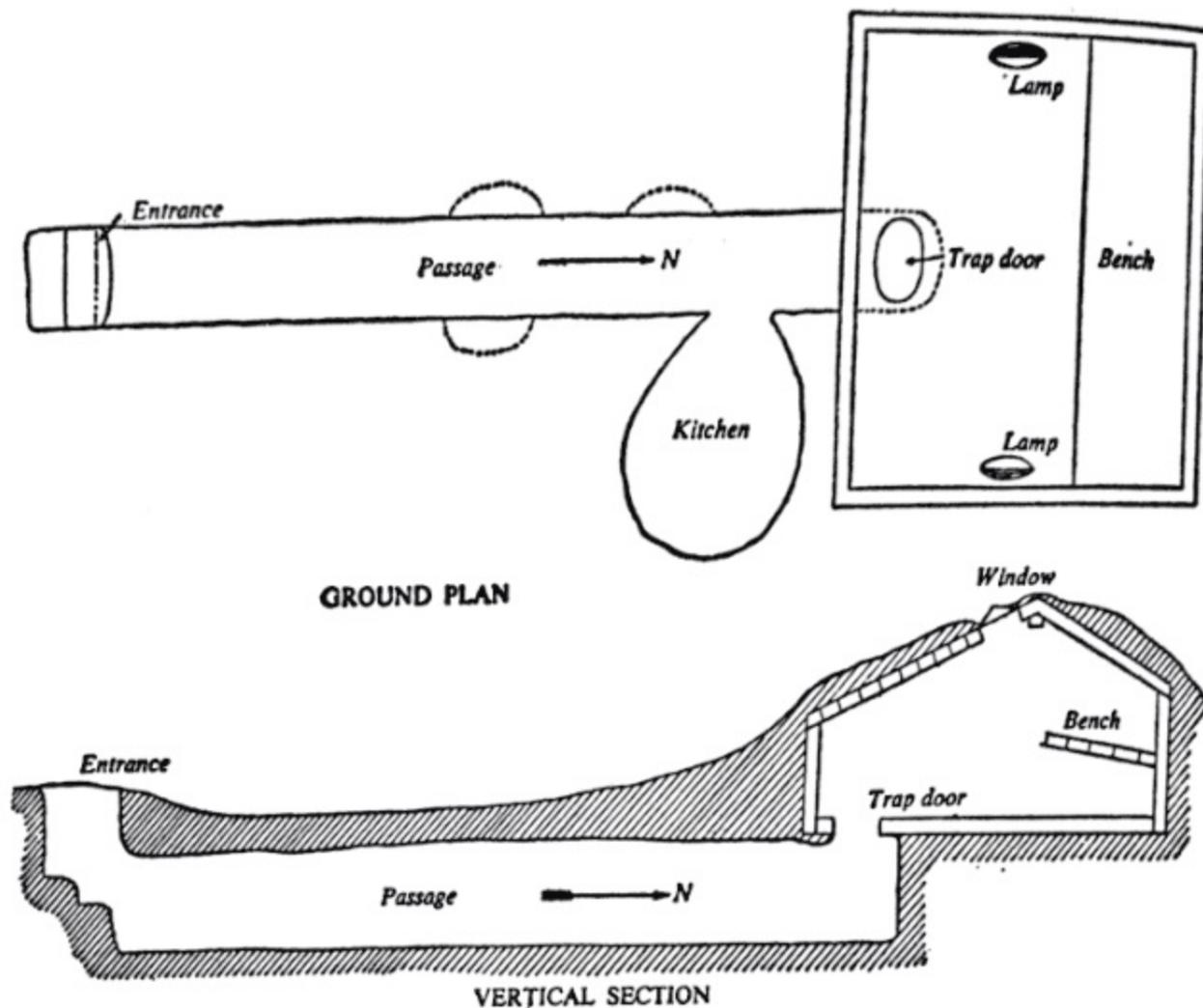
I shall describe a typical day, beginning around 4:00 P.M., as the last daylight fades from a clear sky at a typical temperature of 40° below zero F.

In the North Dakota of my youth I was used to shivering at 40° below in a 40-pound wool-and-buffalo coat outfit if I sat still in it out-of-doors for a half hour. Now, in the arctic Mackenzie delta, I find myself in a 7-pound caribou-skin Eskimo outfit, sitting nearly motionless on a block of hard snow for hours without the slightest tendency to shiver. Of course I make the usual European mistake, crediting the marvelous caribou skin material of my suit with my warmth and comfort. Only gradually through years did I shed this belief. Eventually, by the time I had published several volumes about the Arctic, I came to realize that the truly marvelous thing about Eskimo clothes is not materials but engineering — the same principle being applied to Eskimo garments as to Eskimo houses.

Though the daylight is gone, and there does not happen to be a moon, the starlight reflected from the snow is bright enough so that at a quarter mile the platform cache near our house is clearly visible, its spruce-log stilts supporting a platform on which our tons of fresh river fish are safe from the keen appetites of our dogs. The house we imagine rather than see; for although its peak was, in summer, 8 or 9 feet above ground level, the whole structure has long since been so drifted over with snow that in the bright twilight of a mid-January noon it is no more than a swell or bulge in the expanse of white.

What we do see, by the starlight of late afternoon, is the outer door of our alleyway, facing us as we come from down-slope, from the river ice. This 6-foot door, framed in logs, is always open. There is no way of shutting it, but it is shielded by a snow-block windbreak that is shifted from day to day as the wind changes. We do not want a gale, if it were to blow up, to drift snow into the 30-foot alleyway that is a curl-up place for the dogs and, along its wall, a storehouse for nonedible goods.

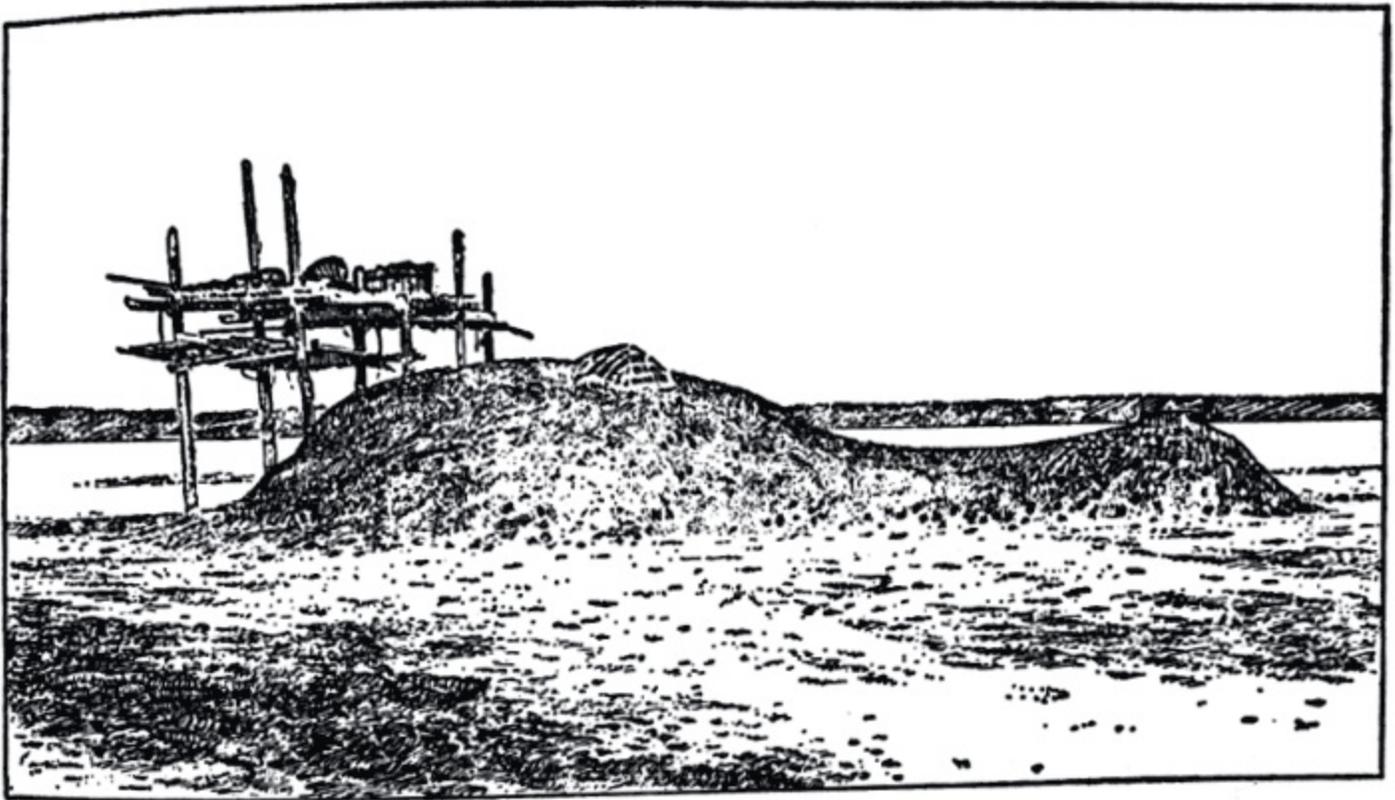
The length of the alleyway is faintly illuminated with taper-like flames that burn in small oil lamps (seal or whale oil). But at the remote end a flood of yellow light pours down through the 30 by 40 inch flap door that will never be closed all winter. The dogs are well mannered and have been taught not to take advantage by climbing up through the open door but to stay down in the alley. Beneath the doorway are two or three treads, and these I mount to scramble up into our living room.



Plans of Eskimo winter house (northern Alaska)

As I climb up into our dwelling my accustomed glance takes in the scene. Two or three boys or girls are carrying around muskox-horn dippers of ice water. These children are six or eight years old and are naked except for the briefest of trunks. Smaller children are wholly naked on their mothers' laps or rolling around naked on the floor. The cupbearers offer the cold water to whoever beckons them. The thirsty gulp to compensate for the sweat that is pouring down their faces and torsos. The grown men and women, stripped above the waist and below the knee, are sitting Japanese-fashion on the foot-high bed platforms, or on hassocks if they want to be still higher up and warmer.

Slipping my coat-shirt over my head, I roll it into a bundle, walk smartly toward my assigned sleeping place, seat myself on the coat as a hassock, and rapidly strip off my footgear and trousers. I then put on a pair of last year's worn-out trunks that somebody has given me. My haste in undressing is to prevent sweat from dampening my good outdoor clothes.



Summer view of Point Barrow winter house (northern Alaska)

Entire days spent in the house taught me that temperature throughout the day would be, most of the time, around 70° F. without causing anyone to sweat. Around 2:00 P.M., however, the big cooking lamps are lighted. The moss wick along the flame edge of the lamps has been so lengthened that each burns without smoke or smell but with a flame of 10, 15, or even 20 inches, creating a terrific heat. At first this heat is neutralized; for the pots are filled with cold water and in it are segments of frozen fish, each 3 or 4 inches long and with the entrails already removed. Entrails are dog feed, as is everything from inside the fish's body. These are placed on trays for the dog team's one meal of the day, given in the late afternoon.

As the pots approach the boil, the heat from the lamps becomes effective for warming the house and the temperature steadily rises. At 4:00 or 5:00 P.M., the heat within doors is roughly stratified at about 50° in the bottom layer, just above the floor; 80° at our shoulder level where we sit on the bed platforms; and 100° or more at just below the roof, 7 feet above the floor.

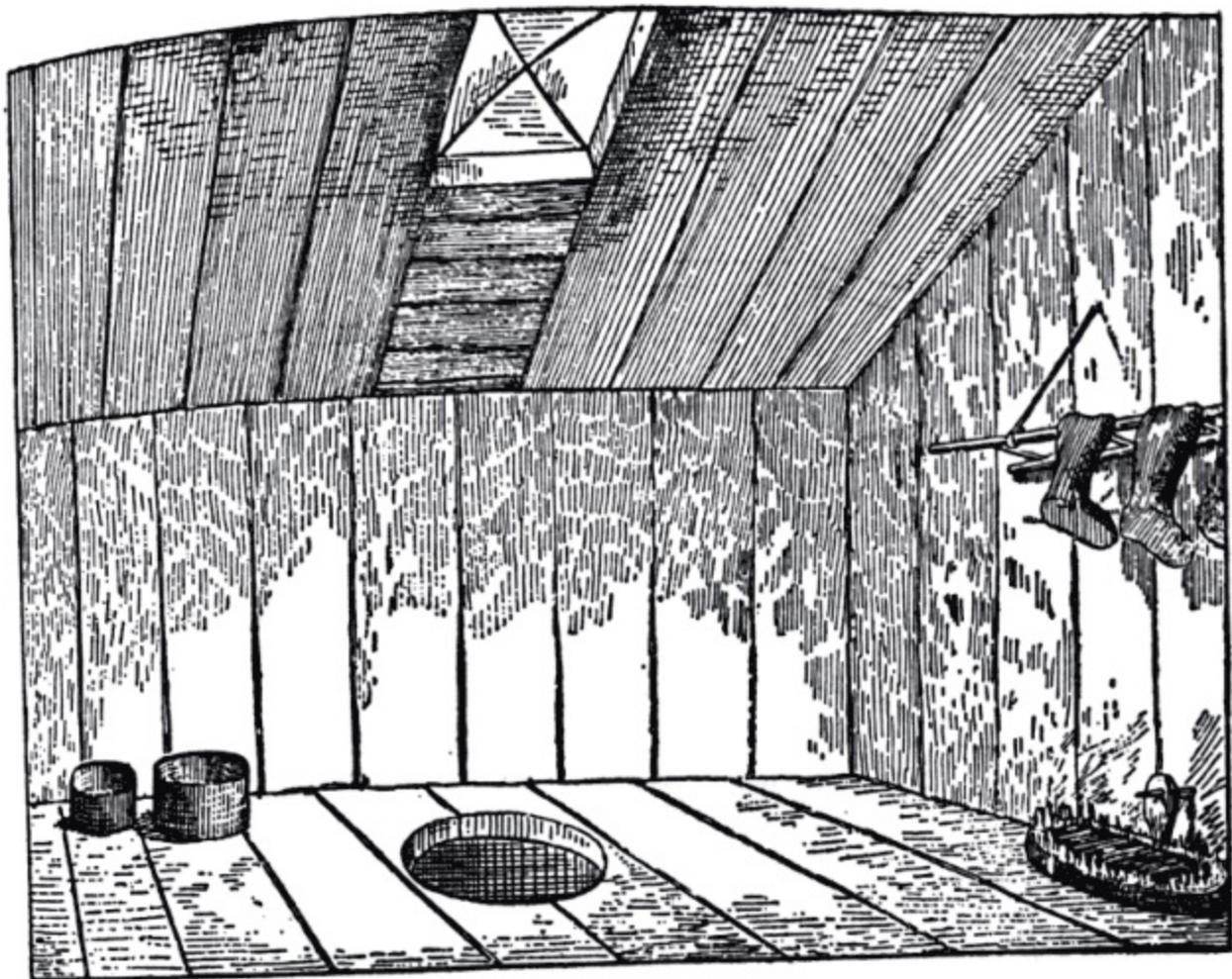
For the heat, produced by the lamps and the body warmth of the people, is controlled by gravity and regulated by the diameter of the ever open ventilator, located at the peak of the roof. Except for the door in the floor and the ventilator in the ceiling, the house is as nearly airtight as the Eskimos could make it when they built it last summer. The supporting framework is of split or round spruce driftwood timber. The frame is shaped like an inverted wooden basket. The walls slope inward slightly. They have been so banked with loose earth — not sod — that they are 5 feet thick at ground level and about a foot thick at the “eaves.” The “cottage” roof is covered evenly by about 4 or 5 inches of loose earth.

The intended openings of an Eskimo winter house are only two, the 30 by 40 inch trap door in the floor and an 8 by 8 inch ventilator in the ceiling. The air outdoors may be as cold as 50° below zero

F. — hardly ever colder. Where the entrance treads begin, 4 feet below the floor, the chill of the alleyway is that of outdoors. It is still far below zero up to where the outdoor air begins to well up through the trap and spread in a thin film over the level floor that is a foot lower than the bed platforms.

When I was new in this house, I at first thought it insufferably hot at my shoulder level on the bed platform. The Eskimos sympathized with me, for they supposed whites to have certain physiological peculiarities, one of them inability to stand extremes of either heat or cold. They considerably explained to me that I could cool off by lying flat on the plank floor. This I did and estimated the temperature at 50° F. After a few days I came to realize that sweating is not unpleasant when you are practically naked, as we were. In a few weeks I had proved to myself that my physiology was as well heat-controlled as that of the Eskimos. My trouble had been mental. I had been brought up with the wrong sort of taboos and with handicapping beliefs.

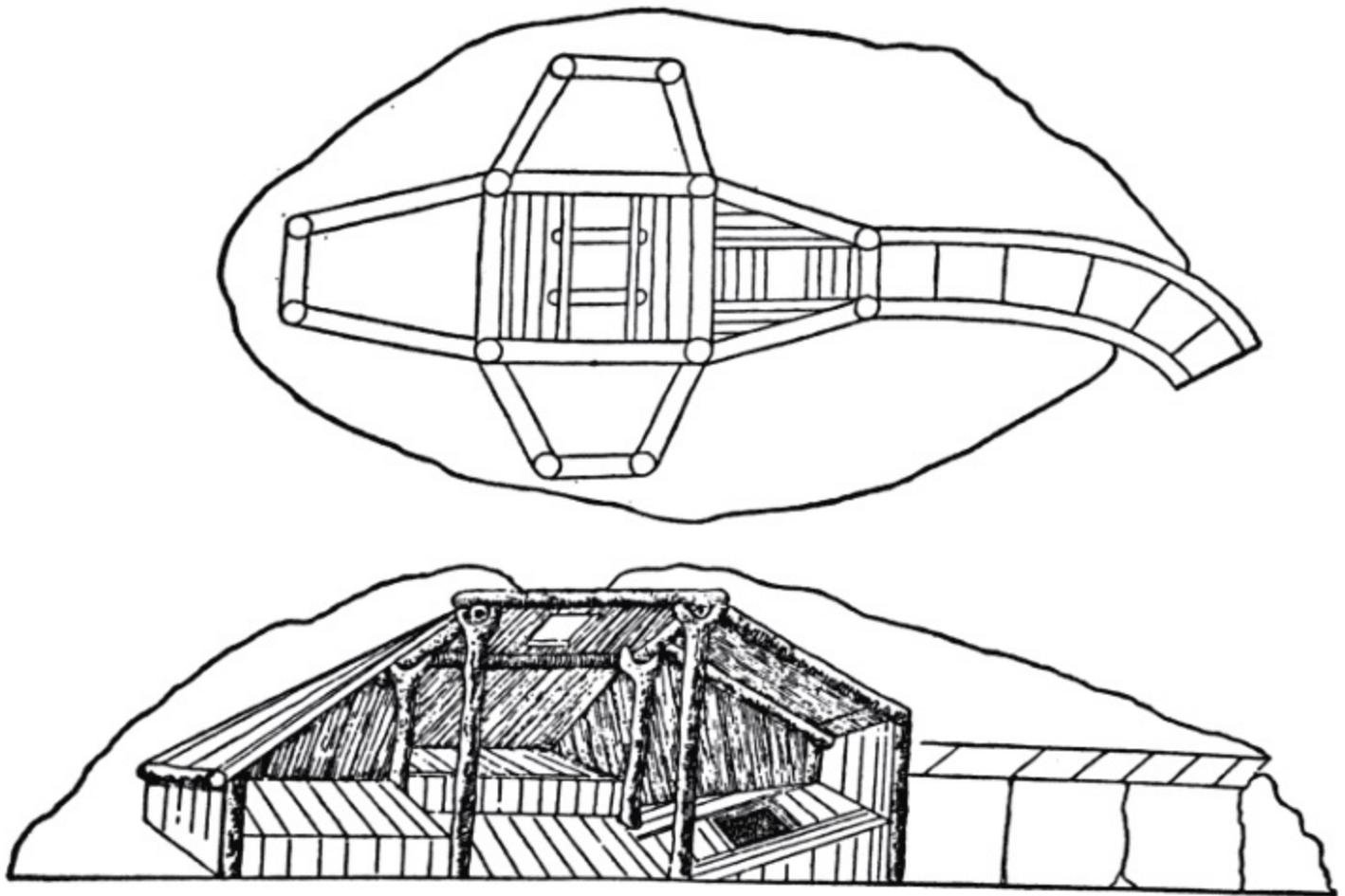
One of the things that surprised me was the slight use of chamber pots. I was accustomed to them in Dakota and in New England, where I later lived, and most of all in Old Country England. I expected a strong and disagreeable smell. But I noticed none, and reminded myself that only small children used the pots and that the house ventilation was ample, for the gravitational difference between the heavy cold air of outdoors and the lighter warmed air of indoors was such that the emerging draft through the ventilator was furious. Now and then I experimented with the ventilation by climbing on the roof of our dwelling and holding a palm 12 inches or so above the ventilator shaft, whereupon the draft pushed against my hand, shoving it up.



Interior of Point Barrow winter house, looking toward trap door

Indoors, however, I could sense no movement of air up through the house. For the aperture of the trap, through which the fresh air must have been rising into the house, was so much larger than the diameter of the ventilator, that while the uppermost hottest air escaped into the outdoors as a blast, the cold air within doors rose imperceptibly. That the lowest foot of floor temperature seemed like 50° , instead of like zero or 40° below, I explained to myself by the "principle of the diffusion of gases" and by the constant stirring-up of the air resulting from the scurrying about of the children.

As I say, only babies used the chamber pots. Everybody else ran outdoors whenever they needed to, little tots of three or four years and all the rest of us. At first I used to put on clothes, and the Eskimos advised it; for, since I was white, they supposed that not merely would I suffer pain from the cold but would also "catch cold." I eventually learned that they had acquired this idea from whalers, who had explained to the Eskimos that people catch head colds and become ill if they are suddenly chilled. The Eskimos, I noticed, wore no clothes (other than the house trunks) when they went outdoors briefly, except when a strong wind blew.



Ground plan and section of winter house in Mackenzie region

After a week of seeing people come in from being outdoors three to five minutes in the coldest of calm nights and without a sign of shivering, I began to experiment, going out wet with perspiration and dressed in nothing but my worn-out and brief trunks. I found that I enjoyed the first three or four minutes, even at 50° below. In two weeks I was going out seminaked with all the freedom of an Eskimo. I even started going out without footgear, doing as I was told, being careful not to step

barefoot on metal, a stone, or glare ice. Stepping into powdered snow reminded me of childhood experiences in North Dakota stepping barefoot into a bin of wheat. After four or five minutes of a calm night outdoors, I discovered, I began to feel uncomfortable. In another minute or two I would have started shivering.

After two or three hours of peak heat, with head and shoulders at something like 90° F., we began to cool off. For, the cooking finished, the lamps were reduced from broad flames to a candle-like flicker. Boiled fish was cooled to lukewarm before it was eaten, the broth also cooled before we drank it. Then, as the warmth continued dropping, we told stories and sang songs. Some men tinkered or made gadgets; some women repaired or sewed garments. Around 10:00 P.M. we had a cold supper from the leftover boiled fish. By now the house was down to 70° and someone stuffed a mitten or a wad of skin into the ventilator shaft to cut the aperture down a third or even two-thirds. The ventilator was never entirely closed. As said, the trap door was always wide open.

As I look back, the thing that strikes me most sharply is the interaction between sweating and drinking. We enjoyed the steaming sweat and the copious drinking between four o'clock and seven o'clock. Ice water was at times replaced by chunks of snow which some liked to slice with a knife and eat as an Iowan might slice and eat a watermelon on a hot summer evening.

I have spoken of streaming sweat. Indeed my housemates at Tuktuyaktok may be said to have eaten their meat in the sweat of their brows — at dinner, that is, though not at other meals, as will appear. To me it seemed that there was danger that the perspiration would stream to the floor and that we would find ourselves sitting in puddles. I never saw this happen; for we always swabbed ourselves with something or other during the three, or at most four, hours of excessive sweating. As swabs we used pieces of worn-out fur garments which had been cut up for this use, or remnants from the women's work of tailoring or mending clothes. Chiefly we used excelsior made for the purpose.

A part of the quiet evening work of the men was to shave steadily at blocks of dry spruce with their sharp “crooked knives,” making the wood into an equivalent of our commercial product. Baskets of excelsior stood around conveniently. We took handfuls, swabbed ourselves, and placed the damp swabs in other receptacles that were used as we use wastepaper baskets.

As said, the custom was to run out, stripped to the waist, at any temperature — but only when there was little or no wind. To go out into a blizzard we dressed. Then it was usual to call on a small boy or girl to help us wipe ourselves dry before dressing. While you wiped your own front, the small assistant would wipe your back with excelsior. Then you slipped down through the trap door into the alleyway and paused for details of dressing, such as tying the drawstrings and the ankle lashings of your boots.

On an ordinary day, when you were going out stripped the chill of 30° or 40° below felt good on your overheated torso and the sweat started drying off as you walked out through the alley. Outdoors the chill felt good, too, though not for long — not for over five minutes. It never felt good at all if a strong wind blew.

Bedtime was around 11:00 P.M. Several of the men had watches and there were two or three clocks in the house. Timepieces are among the first things transition Eskimos buy when they are getting

civilized and our people were always consulting the time. If there were visitors, we had spare floor room for about ten; if visitors numbered more than that, they built their own camps around our house and occasionally there were several of these. We regulars slept on the bed platforms of three alcoves, our heads toward the center of the house.

Our bedding consisted of caribou skins. They had been rolled up along the wall to be out of the way of possible dripping sweat. Now they were spread out. Each of us had a light robe. Some, including me, had a Hudson's Bay Company blanket. We undressed with an approximation of the European type of modesty. I kept my trunks on till I was under the blanket, whereupon I took them off and slept naked, as did everybody. My pillow was my rolled-up coat. There were no nightshirts, pajamas, or such. Anybody who needed to go out during the night, and who did not want to dash out stripped, would put on his trunks, slip a shirt on, and sometimes would put on boots, though without socks.

During the night, the temperature in the house was about 70° F; nobody was sweating and no body-wiping precautions were needed before dressing. I found, too, that when you go outdoors semistripped from a house temperature of 70°, the outdoor chill begins to get unpleasant rather promptly. Three minutes at 40° below was all I cared for. It is only when you are overheated that stepping out into an intense still cold feels pleasant as long as four or five minutes. Going out from great heat into dry cold produces no shock.

Formerly, I was told, practically every village had a men's club house, or bath house, where they courted shock. They would sit wholly naked at temperatures considerably above our Tuktuyaktok dwelling maximum of about 100° F. and would then run out and roll in the snow. The shock of this was greatest when the snow was slushy, as in the spring, for dry snow is a rather slow conductor of chill. Sometimes they produced the desired shock by standing in a corner and having somebody, usually a small boy, splash them with ice water. This is, of course, what the anthropologists call "stimulant bathing", and is similar to our well-known Turkish or Finnish baths.

The discontinuance of the bath house, and of stimulant bathing, had occurred about five years before, I was told — in 1900, as I learned from Captain Leavitt. The cause was the devastation produced by the great measles epidemic of that year, which swept all Eskimo and Athapaskan Alaska, and extended 400 miles eastward into arctic Canada, to be stopped by the uninhabited stretch of some 200 miles that separated, for at least the previous 100 years, the Mackenzie from the more easterly Coronation Gulf communities.

White men's information shows the highest death record to have been that of an Alaskan village near the mouth of the Kuskokwim which lost every grown person and all children except one girl of about six. The lowest careful estimate of which I have heard is for the Alaskan village of Cape Prince of Wales, where only about 25 per cent died. The Mackenzie deaths numbered, Leavitt thought, somewhere between 30 and 50 per cent.

At Tuktuyaktok we were reminded of the 1900 epidemic every time we went outdoors. For our house was surrounded by several empty houses. I gathered that before the measles devastation there had been perhaps a hundred persons in the village regularly and there was a club house, a *kadjigi* or *kadyigi*, that was a sort of inn. When visitors came there would be singing and dancing at the club. Around the ten or eleven o'clock bedtime, the villagers would go home, leaving the visitors to occupy

the kadjigi.

At Tuktoyaktok during midwinter, breakfast came around 8:00 in the morning. Perhaps two hours earlier we had the first stirring.

Among our civilized amenities we had matches, the big sort which crackled as you lit them. Somebody would rise quietly on an elbow, quietly stuff and then noisily light a Chinese-type pipe, the sort that had been in use in Alaska and western Canada long before the Russians reached Alaska. The crackle of the match awakened two or three other sleepers, who lit their pipes. Quiet talk then became general.

How might the weather be outdoors? Time enough to learn about that, it was suggested, whenever some enterprising woman mustered the energy to go out and fetch the makings of breakfast. In a sort of provocative dialogue, two women would nominate each other. Then they had an impromptu race dressing. In something less than a minute they would scamper across the floor, drop into the alleyway through the open trap door, and return presently with small armfuls of fish, like farm boys bringing in wood for the kitchen stove. Stooping so as not to drop the fish from too high up, they rolled them out on the floor, where they would gradually begin to soften from their glass-like hardness. (If dropped from too great a height, the glass-hard fish might have shattered on the planks of the floor, as if they were actually made of glass.)

The question may arise: Why did these two women dress at all, if the Mackenzie Eskimos were in the habit of going out seminaked? There are three answers, the first of which I have already given — it does not seem pleasant to go out naked unless you feel overheated at the time; and the morning warmth of our house was only around 70°, the night lamps having been trimmed low and the ceiling ventilator kept moderately open. The second answer is that nobody knew what the weather might be, for the house was soundproof and there could be a howling blizzard outside without its being heard. The third and sufficient reason for dressing was that the women were going to bring in armfuls of fish at perhaps 50° below zero; and at that temperature iron, stone, or a frozen fish would sear a bare arm just as if it were red-hot iron.

At this stage the only dressed persons were the women. The rest of the occupants of the house smoked and talked. I, the only nonsmoker (except the children, of course), lay dozing on my pillow, or wide awake listening to the quiet talk and attempting to pick up a new word or two of the language — which it was to take the first five of my total eleven Eskimo years to master. (To me my housemates spoke the Mackenzie trade jargon, consisting of about 600 uninflected words, a bit like pidgin Chinese. The true Eskimo language consists of more than 10,000 highly inflected words.)

In about an hour the frozen fish were, on their surface, soft enough so that they indented a bit when the women tentatively pinched them. Then came into play the broad-bladed women's knives that resemble our harness-maker's knives except that the Eskimo *ulu* is much larger. The fish were of several species, all from Mackenzie River fresh water, those selected for breakfast varying from 3 to 6 pounds in weight. As head chowder is thought the best chowder in New England, so were heads thought the best parts of a boiled fish by my Eskimos, and next after them the tails. Accordingly heads and tails, with the skin still on, were cut off and placed in a pot swinging over one of our lamps. This was intended for the children's breakfast, which would come after we fishermen had gone down to the

river to our jobs.

The children provided for, the rest of each fish was skinned. A slit was run along the back and along the belly. Then the women bit into the edges of the skins and peeled them off, in somewhat the same manner as peeling a banana. Next the fish were cut in 3-inch segments and placed on trays, the outside of each piece now frozen not much harder than our ordinary, or rather hard, ice cream. The inside of each piece was harder, and the entrails hardest of all, for they were at the core of each piece.

When the trays were piled high, and passed around, they reminded me of corn-on-the-cob meals such as we used to share in Dakota. We Eskimos now rose on one elbow, still not dressed and our shoulders covered with blanket or robe. We each selected a piece of fish as the trays went by. Then we gnawed the segments from the outside, as if eating corn from a cob. When we got near the center, the entrails, we discarded them as farmers do corn-cobs and put them on the dog-feed trays. (I have read in books that "Eskimos eat the whole animal"; but I saw nothing of this, whether then among fish eaters or later among caribou eaters. Eskimos usually have dog teams that eat what the family does not like so well. Only in time of food scarcity have I known Eskimos' eating all parts of animals. Generally speaking, whatever is inside fish or caribou is dog feed.)

At breakfast, as at all meals, each had as many helpings as he liked. There was no broth now, or any warm drink. Usually we drank nothing during breakfast but had a sip of ice water at the end of the meal. We were not thirsty, for there had been no sweating since 8:00 or 9:00 the night before. We had had our last big drink around 10:30 before going to bed.

At all meals there was convenient to each of us a bowl of beluga whale oil or seal oil, or a bit of treasured past summer's polar bear fat. We preferred pieces of fish each of which had enough fat of its own, and so it was in other years when we lived on caribou; but no well-appointed Eskimo meal is without a bowl of oil or a tray of fat meat that may be added to the regular food if desired.

Of course, no primitive Eskimo eats by any theory, only according to the desire of the moment. There is protocol about offering fat to a guest, but none about his accepting or declining it.

After breakfast came leisurely dressing. There was no hurry such as there had been about stripping in the evening — no danger now of getting fur clothes damp through sweat, for the morning temperature was the customary one of New England winter homes, though a bit warmer than the January homes of Old Country England. However, I was advised to put on my coat last, remaining stripped to the waist until a moment before descending through the trap door.

In dressing, I first put on my 2-pound caribou-skin breeches, the hair side inward. Then I pulled on caribou-skin socks and boots. Each boot had a drawstring at its top, which tightened to hold up both the boot and the sock. There was a slipper sock to wear between sock and boot. The total weight of boots, socks, and slippers was about 2 pounds; so I was wearing 4 pounds as I stood up, my trousers suspended, belt fashion, by 3 drawstring above my hips. The trouser legs, open at the bottom (no drawstring), hung loose to about halfway between knee and ankle.

Just before descending into the alleyway I put on my 3-pound coat. I called it by its Eskimo name of *attigi* when speaking to the Eskimos; in my diary I sometimes called it a coat and at other times a

shirt. Nobody called it a *parka*. That Siberian word did not reach the Eskimos of Point Barrow or the Mackenzie until after my time, though I understand the miners of western Alaska, some of whom had mined in Siberia, began speaking of parkas soon after the Nome gold rush of 1900. The *attigi* was of caribou and was worn hair side in. An attached hood might be pulled up to protect the ears, but nothing ever shielded the front part of the head, or the cheeks and nose.

As I wore my 7-pound soft-as-velvet clothes, walking the quarter mile down to my fishing station on the river ice, the garments hung loose, touching me at the fewest possible points. On top of my shoulders the attigi rested its almost imperceptible weight, snug but not tight either there or at the throat, thus permitting the very slow upward seepage of the air that had been warmed by my body heat lower down. The principle was the same as in the house — the shirt was freely open downward, as it hung loose to halfway between hip and knee, somewhat as the house was always freely open downward. And, just as the house ventilator was seldom fully open upward, so ventilation beneath the shirt was only meager upward, the body-warmed air percolating up over my shoulders and into the hood to warm my ears; while through the wide downward opening, around my waist the cold air could rise up no faster than the warmed air escaped near shoulder and neck.

The control over the air within my trousers was more rigid. Practically none rose up through the trouser legs that were open at the bottom, for practically no air was escaping upward because my drawstring belt was tight above my hips and the material of my garments was nearly airtight. Thus both shirt and trousers acted as containers of air. I was really dressed in two sheets or pockets of air, one under the shirt, held in place by that garment, and the other lower down held in position by the trousers.

Air is, next to a vacuum the best of nonconductors of chill. I was dressed in two air garments that protected me, jointly, from below the knee to the tops of my shoulders — even higher up than that by the warmed air seeping up into the hood.

This is what I have had in mind in saying that when the Stone Age Eskimo went outdoors he carried tropic warmth around with him inside his clothes.

For the fishing day, this was the continued story of my warmth and comfort. I reopened with an Eskimo-type ice chisel the fishing hole that had been covered during the night by the formation of 5 or 6 inches of ice. I moved my snow-block seat, if necessary, to the windward side of the hole; and, with my back to the wind, started fishing. I never felt any chill; but I might get a bit too warm. If I did I would take off my mittens and hold my spruce-rod fishing pole with bare hands. I threw back my hood so it would leave the top of my head bare, though protecting my ears as a fur collar does.

The sun was a degree or two below the horizon even at noon; but the twilight was bright as the other fishers and I walked toward the house for our 11 o'clock snack. Now, in the bright light, we saw what looked like a column of smoke rising from our ventilator, slender at first but getting thicker upward, the final plume of it drifting off before the hardly perceptible breeze.

The door of an old-time Eskimo house always faces downhill; for gravity controls the air, and heavy air does not flow uphill any more than water does. So we walked up a gentle slope, slightly stooped, through the roofed-over alleyway to where the yellow light of the house played down upon the treads

by which we mounted. As we entered, the children were, as always, naked; but most of the women, and any men who happened to be in the house, now wore footgear and trousers, though they were stripped to the waist.

We fishers removed no garments as we entered, except our coat-shirts. Nobody was sweating as we sat around, eating our ice-cream-hard frozen fish and perhaps taking a sip or two of ice water. There was not the effusive jollity which had met us at home-coming for dinner the night before but rather a quiet amiability. We ate slowly, talked quietly, and were soon on our way back to the fishing.

At 4:00 P.M. we were home again, as we had been the day before. And that is the tale of a mid-January fishing day at Tuktuyaktok.

My purpose is to illustrate how the primitive Eskimos managed their problems in the control of heat and cold, and I have told only the story of a quiet day at home. I must also describe a strenuous day, one spent hunting caribou or journeying afoot. The journey is the simpler of the two to describe here. (For a day of winter caribou hunting I refer the curious reader to any of the first five or six books listed under my authorship in the bibliography.)

When we went off for an expected 20- or 30-mile midwinter traveling day, the dogs pulled a sledge loaded with gear but the people never rode — primitive Eskimo men and women always walk or run, though children may ride. The half hour before starting we spent loading the sledge and hitching up the dogs, so there was no sweat problem. Unless a cold wind was blowing we used our bare hands with loads and dogs. Usually, in this process, we were neither too hot nor too cold.

But with perhaps five dogs hauling perhaps 1,000 pounds on level going the Eskimos of my time expected a rate of about 4 miles an hour, a very brisk walk or a jog trot. At that speed temperature problems arise. Let us assume a typical calm, clear midwinter day around 40° or 50° below zero F.

At the first sign that I may be getting too warm, jogging along, I take off my mittens, if I have been wearing them, and throw back my hood so that it rests around my ears like a fur collar. In less than half an hour I may decide further cooling is necessary; therefore I lift up my *attigi* and, as I run, hold it so that a strip of my bare skin is exposed just above the waist. This is usually enough; after a few minutes of cooling I let the shirt drop back into place.

If the speed gets to be a real sprint, which is protracted, I may find that it is not sufficient to cool just my waist and abdomen. I then decide I need to cool off most of my torso. So now I thrust the fingers of one hand down at the front of my throat and lift the *attigi* upward and forward. A lot of warmed air then escapes through the neck opening. The cold air rises from below and surrounds my whole torso to shoulder level. This creates a grateful sensation. Nothing is pleasanter than cold and dry still air on an overheated skin.

It may be, however, that in spite of cooling hands and torso I continue sweating. The remedy for that is to unleash my boots at the top of the calf of my leg, running with each leg bare for two or three inches above and below the knee like a Scot wearing kilts. If that is insufficient to stop sweating around my thighs and abdomen, I hook a thumb into the top of my trousers in front, at the drawstring belt, and pull forward, pushing in on my abdomen with the fingertips of the other bare hand. The

warmed air of the trousers then escapes upward with a rush and is replaced from below by cold air rising through each trouser leg.

Though sketchy, this description should indicate how to solve the sweat problem when traveling during midwinter in Eskimo country, Eskimo style. It is not a complete solution, for it does not apply below the ankle. As to footgear, Eskimos are no more advanced in cold-weather technique than Europeans. What they do, and what I have done, following them, is to permit what cannot be avoided, just carrying along several pairs of socks, changing them each night, and somehow getting them dried eventually.

From the European point of view there remains one serious problem, that of facial frostbite, say of nose, chin, or cheek. The European view has been that this is potentially serious and must be prevented at all costs. The Eskimo view is that in the case of frostbite an ounce of cure is worth a pound of prevention. Following Eskimo practice, I let any part of my face (but not my ears or nose) freeze as often as it wanted to. On a cold and windy day I have frozen my face fifty if not a hundred times. As I have explained, I often went bare handed, in order for the chilling to inhibit body perspiration. The dry but warm palm was always available. As I ran or walked I felt my face now and then to see if a patch of skin was stiffening with frost. When I had companions, they watched my face for blanching spots, as I did theirs, and we admonished each other. Once a stiffening patch was located, I placed my warm palm over it and in a moment it was gone.

A beard interferes with this technique; for the breath, and also wind-driven snow, will freeze in it, creating an ice mask. On one occasion (which was lesson enough for me) I started off on a cold day wearing a beard. When I felt my chin beginning to freeze I could not get at it to thaw the congealing spot with my warm hand, for the hoarfrost mask of my beard interfered. We were headed for a warm house, miles away, where food and good company awaited, and so we did not stop to make a camp in which to thaw the mask off my face. By the time we got to the rendezvous, I was wearing something like five pounds of ice in my beard, and beneath this shell the skin of my jaws and chin was frozen, the chin so deeply that I still carry the scar of it.

The Eskimo is not heavily bearded. His custom has been to eradicate what little facial hair there naturally is. In practice the well-instructed white man attains the same result by using close beard clippers every second or third day. Then, if you feel a spot freezing, or if a companion warns you of a white spot beginning to spread, you press a warm hand to a bare face and the spot is gone in a moment. Of all the thousands of chin and cheek frostbites of ten arctic winters, my only scar is one caused by a once-worn beard. If a spot is thawed before it exceeds the size and thickness of a dime, not even peeling will result; a nickel-size frostbite, if as thick as a nickel, will cause the skin peeling of a mild sunburn.

The Stone Age Eskimos of our continent's north shore have always lived and traveled by using this technique, in unhurried and unworried comfort. During winter nights, and on housebound days, their lives are wholly tropical in the gravity-controlled warmth and ventilation of their nearly airtight houses. When outdoors, the portable tropics of their nearly airtight clothes have protected them from chill except for their faces, which they tended as I have just explained, and except for the cold air which they breathed in, without any discomfort I ever noticed or heard them complain about.

In these last paragraphs I have been thinking of active males. The healthfulness of the humid-tropics style of Eskimo winter living may be for most women and for all children, greater than for men. In this respect the Point Barrow narratives, quoted in the following chapter, provide clear testimony for the first two or three generations of European-Eskimo contacts, thus for the time during which the Eskimos retained their native ways. This was the time during which no one found cancer among them though many searched. Among those searchers were Leavitt (1884-1907) and Marsh (1897-1912), who followed closely upon the period of the narratives quoted below which date from the 1850's and the 1880's. Since the house life to be described applied most particularly to children, I shall summarize, as an introduction, the experiences of both Leavitt and Marsh, especially those of Marsh, as I learned of them through many conversations.

Marsh believed that the right sort of infancy might help to prevent future malignancies. Therefore he kept warning me not to overlook the manner in which children were reared, both as to thermometric warmth and warmth of affection, and as to food and comfort.

Nakedness seemed to Dr. Marsh an outstanding characteristic of the northern Alaskan infant as of the African or South Sea child, Indoors, Barrow children were always naked, except on rare occasions during the summer; in winter there were seven or eight months each year during which they went naked at temperatures seldom less than 70° F. and often more than 80° F. When an Eskimo mother traveled, and even when she worked outdoors around the house, or fishing, she carried her baby at the small of her back inside her clothes and the naked child was warmed by contact with its mother's body. Children up to five and six ran naked indoors during the winter. For traveling in winter, youngsters more than two years old wore clothes, though they were also bundled up in loose furs on the sled.

Infant nutrition, Dr. Marsh argued, could perhaps show its effects well into adult life. A child was usually at the breast for as long as three years. Marsh had seen cases of more than six years — so had Leavitt; and so have I, since. At the age of a few days Eskimo babies started receiving, along with their mothers' milk, food masticated by the parent and passed directly from mouth to mouth. Thus she fed the child on what she herself liked best — always, of course, lean and fat meats, except in case of famine, when vegetables might be included and when the child and mother fared alike — neither of them well but the child a little better than the parents.

A repeated caution: Though frontier doctors, as I have known them in Alaska and northern Canada, talked a great deal about the warmth of Eskimo winter living, with its resultant copious sweating and drinking, they seldom failed to indicate that they considered these factors to be secondary as possible inhibitors of cancer. Most important in their thinking was food and its handling.

On that note, we turn from my own personal testimony of the years following 1906 to consider two sets of parallel but older testimonies, those of Simpson (1852-54) and Murdoch (1881-83).

13. Tropical Winter Life At Point Barrow — 1852-83

One of the nineteenth century's great tragedies had among its compensating results that it left us what most agree is a great classic of Eskimo history and ethnology: "Observations on the Western Eskimo and the Country they inhabit; from Notes taken during two years [1852-54] at Point Barrow," by Mr. John Simpson, surgeon, R.N., Her Majesty's Discovery Ship *Plover*. This contribution is part of *Parliamentary Papers: Further Papers Relative to the Recent Arctic Expeditions in Search of Sir John Franklin* (London, 1855).

Everything broke right for preserving a faithful and sympathetic account of the first Europeans who ever wintered on the north coast of Alaska, and of the people among whom they wintered, who were still fully in the Stone Age and most of whom had never even glimpsed a passing European. Around the 1850's so many ships were searching for Sir John and his 129 lost companions that it seemed wise to the British Admiralty to station a depot vessel, the *Plover*, at Barrow to replenish with food, fuel, or anything else necessary, any other expedition that found itself short.

The *Plover's* skipper, Commander Rochefort Maguire, was (October 29, 1852) the first European to report from the north coast of Alaska upon naked men in dwellings of tropical warmth:

"... I paid a visit to the village, accompanied by Mr. Simpson, the surgeon ... The winter huts were now covered with snow; the chief's stood about five feet above the ground, with a square opening at one end, into which we followed through a low dark passage ... when we stood beneath the opening in the floor of the inhabited part of the hut ... Passing [up] through it we stood upon a smooth board floor ... the roof was seven feet high ... There were four or five young men, and two women with children laying about the floor, all naked to the waist, the children entirely so ... it soon became insufferably hot ..."

This was, it seems, Dr. Simpson's first experience, as well as the captain's, with the typical heat of northern Alaskan winter dwellings. Simpson kept revisiting Eskimo homes during the seven winter months of two years. He describes a healthy and happy people of apparently high longevity who, during the winter, lived practically naked — the children wholly so — in earth and wood dwellings that were seldom cooler than 70° F., who avoided all vegetable foods and salt, and who lived on fat and lean fresh meats that were undercooked or raw. Sweating in temperatures which, during the afternoon and evening, ran to 90° and 100° F., they drank ice water continually.

The only non-native "foods" the Barrow people used in Simpson's time were tea and tobacco, which they had been receiving overland and across the Bering Strait from China long before the Russian "discovery" of Alaska. The tobacco the Barrow people, like all Alaskan Eskimos, smoked in Chinese opium-type pipes, inhaling the smoke. They also chewed; but they did not spit, swallowing the juice instead. They did not, apparently, dip or snuff. Following are a few of Simpson's passages that bear on food and food habits, health and longevity:

"These people ... are robust, muscular and active, inclining rather to spareness than corpulence ... presenting a remarkably healthy appearance ... The expression of the countenance is one of habitual good humor ... The physical constitution of both sexes is strong ... Extreme longevity is probably not

unknown among them; but as they take no heed to number the years as they pass they can form no guess of their own ages ... Judging altogether from appearance ... [one man] could not be less than eighty years of age ... There was another ... whose appearance indicated an age nothing short of seventy five. This man died in the month of April 1853 ... There is another man still alive who is said to be a few years older ...

“... in their treatment of their aged and infirm parents they ... not only give them food and clothing, sharing with them every comfort they possess ... Orphaned children are provided for in the same way ... We have never heard of the sick and aged being left to perish ...

“[In their houses, by the use of seal- or whale-oil lamps] not only a good light but a great deal of heat may be produced, so that the temperature of a [winter] house is seldom below 70° F. and so great a care is taken to keep it trimmed, no offensive degree of smoke arises ...”

Following Dr. John Simpson, the next wintering by Europeans on the north coast of Alaska was nineteen years after the *Plover's* and was again for two continuous years, 1881-83. This was not on a ship at anchor but in a house ashore. It was the International Polar Year participation of the United States Army. In the account of this wintering the Eskimos were again sympathetically described. The narrative is readily found in libraries; whereas Simpson's account is a great rarity. Of the sources available (including the formal report of the commander, Lieutenant Patrick Henry Ray), the best description of the people is the account by the anthropologist John Murdoch: “Ethnological Results of the Point Barrow Expedition,” published in the *Ninth Annual Report of the Bureau of Ethnology to the Secretary of the Smithsonian Institution* (Washington, D.C., 1892).

The American anthropologist finds himself in nearly constant agreement with the British doctor, his only predecessor. Examining both, I have found but one outright contradiction, where Murdoch says: “I cannot agree with Dr. Simpson that the turning out of the toes gives ‘a certain peculiarity to their gait difficult to describe.’ I should say that they [the Barrow Eskimos] walk like well-built athletic white men.” On his own Murdoch says that “the males, even when very young, are remarkable for their graceful and dignified carriage ... In walking they move with long swinging elastic strides ...”

Murdoch in the 1880's finds nothing, or very little, to disagree within the Simpson account of the 1850's as pertains, directly or indirectly, to food and food habits. Opening his consideration

of “Physical Characteristics,” Murdoch quotes Simpson: “In stature these people are of medium height, robust and muscular, ‘inclining more to spareness than corpulence,’ though the fullness of the face and the thick fur clothing often gives the impression of the latter.” Murdoch further agrees that “the general expression is good-humored and attractive.”

“For north Alaskan attitudes and methods in caring for the aged, and in bringing up children, Murdoch joins with Simpson in giving the highest praise. Simpson says:

“For the tender solicitude with which their own infancy and childhood have been tended, in their treatment of their aged and infirm parents they made a return which redounds to their credit ... among the people of fourteen summer tents and as many boats [I saw] one crippled man, a blind and helpless old woman, two grown-up women with sprained ankles, and one other old invalid ... carried by their

respective families, who had done the same for the first two during many successive summers ...”

While usually in agreement with Dr. Simpson, Murdoch occasionally disagrees with other writers — for instance, with Dr. Sutherland, who “expresses the opinion that ‘an individual in such case [totally blind] would be quite unfit for the life of toil and hardship to which the hardy Esquimaux are exposed. The neglect consequent on this helpless condition most probably cuts off its afflicted objects.’ This seems quite reasonable on *a priori* grounds, but nevertheless the blind man at Cape Smythe had lived to middle age in very comfortable circumstances ...”

Evidently believing that individual traits are frequently the result of the general way of life, Murdoch says of the Barrow Eskimos: “As a rule, they are quick-witted and intelligent ... In disposition they are light hearted and cheerful, not easily cast down by sorrow and misfortune.”

In addition to agreeing generally with Simpson's dietetic observations of the 1850's, Murdoch amplifies in the 1880's:

“The food of these people consists almost entirely of animal substances ... We saw and heard nothing ... of eating the half-digested contents of the stomach of the reindeer ... As far as our observations go these people eat little, if any more fat than civilized man; and, as a rule, not by itself ... It is usually supposed, and generally stated in the popular accounts of the Eskimos, that it is a physical necessity for them to eat enormous quantities of blubber in order to obtain a sufficient amount of carbon to enable them to maintain their animal heat in the cold climate which they inhabit. A careful comparison, however, of the reports of actual observers shows that an excessive eating of fat is not the rule ...

“We saw these people eat no vegetable substances, though they informed us that the buds of the willow were sometimes eaten [especially in time of famine] ... Food is generally cooked ... Meat of all kinds is generally boiled ... and the broth thus made is drunk ... Fish are also boiled but are often eaten raw ... Meat is sometimes eaten raw frozen ... When living in winter houses they ... have no regular time for meals, but eat whenever hungry and have leisure. The women seem to keep a supply of cooked food on hand for anyone to eat ... They are large eaters, some of them, especially the women, eating all the time ...” Elsewhere Murdoch relates that during winter the Barrow women stirred around very little, did little heavy work, and yet “inclined more to being sparse than corpulent.”

Murdoch was impressed with “the habitual drinking of water, which the people consume in great quantities ... and like to have very cold ... When tramping about in winter they eat large quantities of [crushed] ice and snow ... This great fondness for plenty of cold water has been often noted among the Eskimos elsewhere ...”

Murdoch is, if anything, warmer in his praise than Simpson for the social relationships and especially the home life of the Barrow Eskimos:

“The women appear to stand on a footing of perfect equality with the men, both in the family and the community. The wife is the constant and trusted companion of the man in everything except the hunt, and her opinion is sought in every bargain or other important undertaking ...

“Children are nursed until they are 3 or 4 years old, according to what appears to be the universal habit among the Eskimos ... The child is carried naked on its mother's back under her clothes and held up by the girdle ... When she wishes to nurse it she loosens her girdle and slips it around to the breast without bringing it out into the air ... We have never heard of a single case of infanticide ...

“The affection of parents for their children is extreme, and the children seem to be thoroughly worthy of it. They show hardly a trace of fretfulness or petulance so common among civilized children, and though indulged to an extreme extent are remarkably obedient. Corporal punishment appears to be absolutely unknown, and children are rarely chided or punished in any way. Indeed they seldom deserve it; for, in spite of the freedom which they are allowed, they do not often get into any mischief ... The older children take very good care of the smaller ones ...”

Murdoch found that in the nineteen years since Simpson there had been only a slight change in the way of life:

“Since 1854, when the first New England whalers came as far north as the Point, there has hardly been a season when ships have not visited ... The Barrow Eskimos have however adopted very few civilized habits. They have contracted a taste for civilized food, especially hard bread and flour, but this they are unable to obtain for 10 months in the year and they are thus obliged to adhere to their former habits ...” Elsewhere Murdoch speaks of the fondness of Barrow Eskimos for “sugar and molasses; and some of them are learning to like salt ...”

Murdoch's verdict in the 1880's on the Barrow Eskimos, that “the have however adopted a few civilized habits,” in my opinion still held when I first spent time with them some twenty-five years later, in 1908. But his conclusion was no longer applicable twelve years after my time, when the Presbyterian medical missionary Dr. Henry W. Geist, and his trained-nurse wife Mollie Ward Geist, took charge of the mission and hospital. This I know from numerous sources, but especially from an as yet unpublished book-length manuscript which I have been fortunate to have on loan.

After a preliminary year at Cape Prince of Wales northwestern Alaska, the Geists reached the state's northern tip, Barrow, in 1921, and remained in charge of Farthest North Hospital and the mission till 1936. After their retirement they lived at Monticello, Indiana, where Dr. Geist wrote *Seventeen Years with the Eskimos*. He died in 1955 and in 1957 Mrs. Geist lent me the manuscript of the unpublished book. The Indiana physician found Alaska's most northern Eskimos no longer uncivilized, and no longer healthy. But from conversations with Charles DeWitt Brower, who had lived at Barrow since 1885, and with a few elderly Eskimos, some of whom still remembered Maguire and Simpson (and many of whom remembered Ray and Murdoch) — from conversations with these, and from other sources, the Geists became convinced that there had formerly been a high average of health and longevity among the northern Eskimos. With Mrs. Geist's permission I quote from Chapter 24 of Dr. Geist's manuscript:

“For untold centuries ... the Eskimo of the far north had solely a carnivorous diet ... He was healthy ... He suffered from neither tuberculosis nor any venereal disease; and had rheumatism, if at all, in a limited degree. Barring accidents, starvation during lean years, and epidemics of unknown character,

he lived to a very great age with his teeth intact, but worn to the gums since he used his teeth as a third hand ... When starches and sugars were introduced by the whalers and the traders he at once began the development of carious teeth, something he never had previously.”

In the rest of his manuscript Dr. Greist names a good many other troubles, besides rottenness of teeth, that he thought had come to the Eskimos with the introduction of European food and food habits. I shall return to those later.

With relation to the medical missionary theory, that “the tropical life of the polar Eskimos” may perhaps have had an inhibiting effect upon cancer incidence — regarding this possible relationship, it should be emphasized that what I have said *applies hardly at all except to winter living*. But winter constitutes about two-thirds of the Eskimo year.

Sometime in May, whether at Barrow or in the Mackenzie delta, the snow on the nearly flat earth roofs of the houses began to melt and the roofs began to leak, whereupon the family moved into tents that had no gravity control of temperature. Also, the nearly airtight and gravity-heat-control clothes were not replaced by anything suited to keeping the people warm in the raw and sleety weather of spring. So in May began the time when the Stone Age Eskimos did their shivering of the year. This trouble decreased when summer advanced, for the climate warms until the days are 60° and 70° F. in the shade at Barrow, and a good deal warmer than that inland.

The autumn, also, is a time of chill. I, for instance did bit of shivering with the Shingle Point Eskimos during early September in 1906. By late September we were in fairly comfortable houses, though we had to burn a lot of driftwood in sheet-iron stoves to manage it. For our community was so civilized already that they used doors in the sides of the houses, which we had to open and close furtively against the chill that was no longer under gravity control but was always free to rush in.

During the pre-Europeanization time, the winter houses that were stationary tropics kept the people superwarm for, say, 240 days a year. Then of the remaining 120 or so days almost half were comfortably warm even on the seacoast; and more than half the days were too warm, inland. It was my experience hunting with the coastal Eskimos, who followed the caribou out upon the northern prairie, between 50 and 200 miles from the coast, that they complained of the heat most of the time from June 15 to August 15, the thermometer frequently showing above 90° F. in the shade.

When men like Captain Leavitt and Dr. Marsh discussed the Eskimos' artificially tropical life as covering only two-thirds of the year, they did not forget that there were also, especially inland, spells of weather that were tropically hot and humid.

So, as the northern medical missionaries saw it, while the artificial tropics of houses and clothes affected metabolism two-thirds of the year, the natural heat of the weather, during parts of the remaining third, continued the tropical atmosphere.

14. The Longevity Of “Primitive” Eskimos

When Dr. John Simpson published the account of a two-year study in northern Alaska in 1855, he put his finger on a statistical difficulty when he said of primitive Eskimos that they “take no heed to number the years as they pass.”

At Point Barrow, a statistically valuable numbering was begun in the 1890's through missionary recording of births. The tally has established that in northern Alaska long life is not common. This, along with similar twentieth century statistical results from other northern fields, has strengthened two sets of convictions — the convictions of the frontier doctors and the convictions of their critics.

The medical missionaries, already committed to the opinion that primitive Eskimos were long-lived, see in the up-to-date figures confirmation of what they believe themselves to have observed, that Europeanization breaks down formerly good native health and thus tends to shorten life. But the critics of the missionaries, who always disbelieved what to them was a baseless legend, see in these first available statistics proof that the frontier doctors of the nineteenth century were deluded, and that primitive Eskimos were never either healthy or long-lived. I shall quote statements by a typical frontier doctor and one by a typical critic.

On behalf of the medical missionaries, and the rest of the frontiersmen, let Dr. Henry Greist speak (from *Seventeen Years among the Eskimos*, previously quoted at greater length): “For untold centuries ... the Eskimo of the far North was healthy ... He lived to a very great age.”

On behalf of the skeptics, nonbelievers in a high longevity among the pre-statistical Eskimos, I quote Dr. Ancel Keys, director of the Laboratory of Physiological Hygiene of the University of Minnesota. In a newspaper exchange with Mr. C. N. Pearson, Dr. Keys wrote on December 30, 1958:

“May I correct some errors in your letter to the Minneapolis Star dated November 23rd?

“First, you should know that extremely little is known about the health of primitive peoples, including the tiny remnant of primitive Eskimos. It is known, however, that their life expectancy is very short and that a primitive Eskimo above the age of 50 is a great rarity.

“Second, primitive Eskimos eat no beef, pork, lamb, or chicken and never have butter, milk, ice cream or cheese.”

The frontier doctors, quoted in this book as believing that the natives formerly had good health and kept it so long as they remained primitive, would surely agree with Dr. Keys that an Eskimo can no longer be called primitive if he habitually eats the foods here listed. Some Eskimos have been eating most of them for decades, if chiefly in canned form. To find Eskimos who had not been contaminated by civilized diet, we must go to one of two sources, the records of the Moravian Church in Labrador or the Russian Church in Alaska. I have consulted both, seeking statistically significant material bearing upon the divergent views of Dr. Greist and Dr. Keys.

Fortunately I have long been in touch with the Moravians and their records. The records of the Russians, however, pertained to a field I had never much cultivated — the Aleut Eskimos. So I

appealed to my friend Professor William S. Laughlin of the Department of Anthropology, University of Wisconsin. He replied from Madison on March 14, 1958:

“First, I should like to call your attention to the splendid table in Veniaminov, Vol. II, table 4, in which ages of those who died between 1822 and 1836 are given ...

“I have seen a number of skeletons of advanced age at death. Thus, one Aleut from Umnak Island gave every evidence of being over 80 years of age. I do not have enough records of this sort to be of much statistical value. They do serve to confirm my belief in the validity of local traditions about aged persons ...

“Concerning Anaktuvik persons [inland Alaska Eskimos] I have the list of birth places and birth dates which Mr. Robert Elsner of the Aeromedical Laboratory kindly made available to me. The number of aged men was notable, as was the absence of aged women ...”

Here Professor Laughlin goes into the details of a study being made jointly by himself and Professor Leopold Pospisil of Yale's Department of Anthropology on a small group of inland Eskimos at the Anaktuvik Pass. Of this group one subgroup of 8 consists of men all of whom were born during or before 1900, all thus 58 years old or older.

When I finally got around to formulating this chapter I wrote Professor Laughlin again. He replied on February 4, 1959:

“Concerning the diet of the Aleuts, we can happily document the fact that not only were they living on fish and sea mammals in the time reported (Veniaminov, Vol. II) but they still have a diet which is heavy in flesh foods ... The Aleuts still depend on salmon, sea lion, seal and store foods, in this descending order.”

Veniaminov's table, from which Professor Laughlin sent extracts, is for the Unalaska district of the Aleutians only, and records 1,170 deaths:

“For the period 1822-36 inclusive, the following numbers died: 92 for ages 1 to 4; 17 for ages 4 to 7; 41 for ages 7 to 15; 41 for ages 15 to 25; 103 for ages 25 to 45; 66 for ages 45 to 55; 29 for ages 55 to 60; 22 for ages 60 to 65; 24 for ages 65 to 70; 23 for ages 70 to 75; 11 for ages 75 to 80; 20 for ages 80 to 90; 2 for ages 90 to 100.”

On receiving Professor Laughlin's letters, I sent copies of them along to Superintendent the Reverend F. W. Peacock, M.A., Moravian Mission, Labrador. His records go back well toward 1771, the founding date of the mission; and there are several stations. Knowing that I had available only limited comparison figures for the Aleutians, he sent me only records from his Hopedale community and covering only the same years as Veniaminov's. Superintendent Peacock's letter is dated at Happy Valley, Labrador, March 25, 1959:

“Upon receipt of your letter I went to the records of the Hopedale [mission] from 1822-36. I discovered that 110 people were born during this period ... 29 died before reaching the age of 10 years; 9 died between the ages of 11 and 15; 4 between the ages of 16 and 20; 6 between 21 and 25; 7

between 26 and 30; 10 between 31 and 35; 4 between 36 and 40; 8 between 41 and 45; 2 between 46 and 50; 10 between 51 and 55; 4 between 56 and 60; 4 between 61 and 65; 8 between 66 and 70; 4 between 71 and 75; 1 reached the age of 79.

“From 1860 to 1879 there were 150 births in the same district, of which number 79 died before they were 5 years old, and a further 10 before they were 10 years old. Another 30 died before they were 60 years old; 30 died between the ages of 61 and 82. One is still living at the age of 81 [in March 1959] ...”

We have examined, then, the mortality records of 1822-36 for 1,170 cases from Alaska and 110 from Labrador. The base line of our immediate concern we shall take at 60, because of the assertion that “a primitive Eskimo over the age of 50 is a great rarity.”

According to our Russian information on 1,170 Aleutian Eskimo births, 46 died in the decade immediately past 60, 34 in the one past 70, 20 in the one past 80, and only 2 lived past 90.

According to our Moravian information on 110 Labrador Eskimo births, 8 died in the decade next past 60 and 5 in the one next past 70, only one of these reaching 79.

Thus the most nearly “primitive” sample group I was able to obtain does not support Dr. Keys very strongly in his contention that “a primitive Eskimo over the age of 50 is a great rarity.” Nor does it quite confirm Dr. Greist's statement that “the Eskimo of the North ... lived to a very great age.” More nearly do the largely non-Europeanized natives of Veniaminov and Peacock accord with the Biblical: “The days of our years are threescore years and ten ...”

As this chapter was being revised, I was reminded that a probably higher than average longevity for the northernmost Moravian mission is, in effect, forecast by what in an earlier chapter was quoted from Sir Wilfred Grenfell's 1909 edition of *Labrador: The Country and the People*. So I wrote Superintendent Peacock, who replied on March 11, 1960:

“At our most northerly station [Cape Chidley], now closed, births were first recorded in 1902. Between 1902 and 1911, inclusive, there were 41 births. Still living, at ages between 48 and 58, are 21. Deaths occurred as follows:

1 day to 6 years —	6
6 to 11 —	2
12 to 17 —	3
18 to 24 —	2
25 to 30 —	1
31 to 36 —	1
37 to 42 —	2
43 to 48 —	3

True, this is a specially selected group which, by the accounts of both Dr. Grenfell and Dr. Hutton,

lived in their youth almost exclusively on seals and generally in the old Eskimo style. Nevertheless it would appear more on the side of Dr. Geist than Dr. Keys that 21 of the 41 were “still living, at ages between 48 and 58,” in March 1960.

15. The Twentieth Century Forgets The Nineteenth

In 1915 the Prudential Insurance Company of New York startled practically nobody by saying that uncivilized people, among whom they named the Canadian Eskimos, have little or no cancer. But in 1956 *The Canadian Medical Association Journal* of Toronto startled practically everybody by saying the like about uncivilized Canadian Eskimos, saying it, that is, over the names of a group of McGill University doctors.

Why was the medical world so ready to accept the medical missionary type of frontier report in 1915, so unready in 1956? To this question I shall present several replies. For incisiveness and sweep the reply of Dr. John Cope will be given first. The introduction to his book indicates that he is writing under a pseudonym, so I shall introduce him by quoting from a signed book that introduced him to me.

The Mortality from Cancer Throughout the World, a work I have cited frequently, was issued during 1915 by the Prudential; it is an 826-page volume by Dr. Frederick L. Hoffman, head of the company's statistical department as well as chairman of the Committee on Statistics of the American Society for the Control of Cancer. As implied above, it runs through Hoffman's work that uncivilized people seldom if ever have cancer. Throughout it is implied, and now and then stated, that this is a common and orthodox belief.

But in later works it appears that Hoffman, though still himself of the same view, realized that there were many skeptics. This is especially apparent in the second of his huge volumes, *Cancer and Diet* (1937). Here, page 90, is the passage I shall use to introduce Cope:

“An exceedingly important work on Cancer: Civilization and Degeneration by John Cope, was published in London in 1932. Cope discusses the early eating habits of the English and the rarity of cancer at the time, the disease increasing as the consumption of meat decreased. He deplores certain civilized customs ...”

Elsewhere I shall go into some of the civilized practices which Cope deplores. Here I quote,* abridge, and paraphrase his views on how and why skepticism arose concerning the reports and views of medical missionaries, and of other frontier doctors. I quote from Cope's “Preface and Introduction”:

“Until the beginning of this century the search ... was for the most part unsystematic ... Cancer was studied mainly as it existed in human beings — that is to say, in the consulting-room, at the bedside, in the operating theatre and in the post-mortem room ... The search was of the widest possible character. Not only pathology, but physiology, anthropology, zoology, botany were made to contribute material, and so also were history, chemistry and statistics ...

* I quote Cope at greater length because his book is hard to come by. It seems to be owned by less than half a dozen of the great libraries in the United States; and when the Dartmouth College Library borrowed one copy especially for me, I had to return it before I had made up my mind what to quote from it. Then I got the idea of trying to buy a copy in England but failed. The next step was to try to borrow a copy in London, and I managed this by getting a doctor friend over there to borrow one and send it to me surreptitiously.

“While the nineteenth century workers were engaged in this comprehensive, if loose investigation,

two great discoveries were announced. ... One was the discovery by Pasteur in 1873 that many diseases are due to the invasion of the body by minute forms of animal or vegetable life; the other the discovery (by Moreau, 1891; Loeb, 1900; and Jensen, 1902) that cancer-cells can be successfully grafted from one animal to another of the same species.

“It would be difficult to exaggerate the expectations which were aroused by the progress in scientific method implied by these two events. Towards the end of the century the opposition with which Pasteur's work had at first been received gave place to a tendency to look for micro-organisms as the cause of every disease; and so it naturally came to pass that the methods of experimental laboratory research, which had proved so successful with cholera and tuberculosis, were made use of to throw light on the nature and origin of cancer.

“Nothing, therefore, could have been more opportune than the discovery that cancers can be grown artificially in lower animals, for it seemed enormously to facilitate the investigation of this disease. Instead of being hampered by dependence upon human beings for the material to be studied, or upon rare cancers in lower animals, the researcher could pursue his investigations unchecked. Whole villages of mice could be collected and observed within the compass of a workshop or laboratory; and, instead of having to wait some forty or fifty years before the growth of the cancer begins, as is generally the case with human beings, the disease could be produced artificially within a few weeks ...

“The researcher, moreover, could use the mouse as he would a test-tube or flask, and throw it away when done with it, whereas the study of cancer in human beings is beset with obstacles. In these, and other ways, so great is the ease of cancer research among mice compared with its difficulties among human beings, that there was every justification for the optimism with which Jensen's discovery was regarded as ‘almost tantamount to the solution of the cancer problem.’

“More than thirty years have gone by since this discovery was made; a whole generation of human beings has been born, has lived and has died; laboratories have been built in all parts of the civilized world; many thousands of pounds have been spent; the lives of many able scientists have been devoted to the quest, and whole libraries of magazine articles and books testify to the patience, industry and ability with which this pursuit has been conducted.

“And now, after all these years of noble toil, not even the most sanguine research worker can point to anything that can by any stretch of the imagination be termed a solution of the problem which the researchers set out so confidently to answer.

“Perhaps no one has more decisively summed up the results than Dr. Woglom, a great American laboratory cancer researcher. And his words are so much the more effective in that he writes in appreciation of research. In an article published last year, with the object of summing up the achievements of laboratory cancer research, so far as human beings are concerned he is unable to point to any sign of progress, any advance whatever ...

“Of the quantity and quality of the labour bestowed upon laboratory cancer research there can be no question ... Nor are those engaged in this work apparently in the least discouraged by the lack of success. On the contrary, they seem full of conviction of the imminence of some discovery which will

reward them for their industry and patience ...

“In accounting for this inveterate assurance of impending success, still existing after a third of a century of repeated failure, it must first be realized that the output of work by cancer researchers is enormous. Although it may be true that from this mountain of labour nothing has so far emerged but a cancer-bearing mouse, those who have been engaged in throwing up this mountain are able men, specially trained in the techniques of the laboratory and eminently fitted for their particular method of study. When, therefore, they assure us with the utmost confidence that at any moment something may happen which may transform this mountain of hitherto useless facts and data about cancer in mice into valuable material capable of solving the problem of cancer in men, we are bound to accept their assurance as the genuine belief of men, who, by their self-sacrificing devotion in the face of enormous discouragement, have earned the right to public respect.

“Yet at the same time it is equally right and equally in the interests of the public and of ourselves as members of the medical profession, that we should face certain consequences which must necessarily grow out of any movement, supported by the public, which fails in its purpose after many years of strenuous effort ...

“Experience has proved that those who have spent a good many years of their lives in experimental research have acquired modes of thought and habits of working which, to say the least, do not make them safe judges of the results of wider methods of inquiry. The very precision and exactitude of detail which are of so much value in intensive research, added to the restricted circumstances of the laboratory, lead to a narrowness of view, to a lingering over minutiae, which must needs unfit those so engaged from taking any part in forms of inquiry for which broad, spacious views are essential. Yet it happens that, thanks to the perseverance and ability of those engaged in research, to their wonderful optimism, and to the generosity with which the public has poured in its contributions, laboratory research has so increased in extent and in influence that it is now generally recognized as dominating all other forms of cancer inquiry. And those who are within its circle are those who now constitute the authorities on all that concerns investigations into the origin of cancer.

“Experimental cancer research has, in short, become so isolated and so entrenched that, without being aware of it, the researcher now almost instinctively regards those who criticize his opinion, question his authority, or adopt other methods of working, not as fellow workers, but as amateurs, as ‘outsiders,’ or even as positive enemies ...

“It must ever be held as one of the worst evils of laboratory cancer research that by its extreme caution, its timid reluctance to accept evidence, its insistence upon proofs suitable only for its particular method of inquiry, it is responsible for holding up for a generation one of the greatest and most promising advances of the nineteenth century.”

According to Cope, then, cancer research has been on the wrong track ever since it became overconverted to Pasteur. And, being on the wrong track, it got still further off course later through also becoming overconverted to the discoveries which we connect with the also truly great names of Moreau, Loeb, and Jensen.

Conclusions similar to Cope's have been arrived at by many, among them the famous authority on

malignant disease, Sir Charles Dodds, professor of biochemistry in the University of London, one of the four vice presidents of the Seventh International Cancer Congress of July 1958. By his permission, I quote from “The Problem of Cancer” in the *London Science News* for October 1949:

“The principles of chemotherapy can be said to have originated in the classic researches of Ehrlich ... After Pasteur and his followers had established conclusively that the majority of diseases were due to the invasion of the victim by bacteria, Ehrlich was the first to conceive the idea of producing a chemical substance which would ‘shoot’ the bacteria but leave the tissues of the host unaffected ... The first great success in this field was the discovery of salvarsan ... This substance, relatively non-toxic to the host, becomes attached to the spirochaetes, the cause of syphilis, and kills them. Since the days of Ehrlich, we have seen ... progress in this field. The sulphonamides and the anti-malarial drugs are brilliant examples ...

“It is only natural that attempts should have been made to apply the same general principles to the treatment of cancer ... [but] the would-be chemotherapist is on very uncertain grounds, since he does not know the nature of the process he is attempting to reverse. The only knowledge he has got is that the cancer cells grow in an unrestrained and disorganized manner as compared with normal cells ...”

Sir Charles then goes on to indicate that in a half century of this kind of study no appreciable progress has been made toward a cure for cancer:

“To conclude, it will probably appear to the lay reader that the situation borders on the hopeless and that, after fifty years of modern cancer research, it is unfortunate that so little progress has been made ...

“[But] advances in pathology and therapeutics cannot be forecast on a time basis, that is to say, in order to know twice as much as we know at the present time it may not be necessary to take another fifty years of intensive work. A discovery in some allied field may alter the whole nature of the problem ... the broader the basis upon which the research is conducted the more likely the successful outcome ... in an entirely unknown field, any form of knowledge may turn out to be of vital importance.”

To illustrate what sort of thing may eventually prove to have been wrong with the standard cancer study, Sir Charles takes a possibly analogous case:

“A hundred years ago one of the great menaces to life was suppuration ... One can well imagine a group of philanthropic people banding together to form an organization to investigate the fatal malady. Having collected the money, they would be faced with how to proceed to spend it. One way would be to form institutes for the study of suppuration, and those would correspond to the purely cancer research institutes.

“Here one can imagine the workers collecting purulent discharges, analyzing, investigating them microscopically, and so forth. We know today that they could have gone on doing this to the present time without getting any nearer to the solution. Before the mystery of suppuration could be solved, Pasteur had to found the science of bacteriology ... we then had to have Lister with his development of antiseptic surgery ...”

Sir Charles Dodds' "The Problem of Cancer" is itself a 17-page abridgment and I have done it scant service by further abridging it. Sir Charles concludes:

"We should take the lesson [of the suppuration example] to heart and realize that everyone who is working in the biological sciences is a potential cancer research worker and may actually be paving the way to the knowledge that will discover a cure of this disease."

With a reminder that I am quoting only a few of those who have been profoundly disappointed in the trend of cancer research since the close of the nineteenth century, I shall follow up Cope (1932) and Dodds (1949) with excerpts from an even more recent (1957) book which I have quoted at greater length in another section — *Cancer*, by Dr. Alexander Berglas of the Pasteur Institute in Paris. By permission of Dr. Berglas, I quote from his preface:

"Over the years, cancer research has become the domain of specialists in various fields. Despite the outstanding contributions of these scientists, we have been getting farther and farther away from our goal, the curing of cancer. This specialized work, and the knowledge gained through study of the individual processes, had the peculiar result of becoming an obstacle to the study of the whole.

"More than thirty years in the field of cancer research have convinced me that it is not to our advantage to continue along this road of detailed analysis. I have come to the conclusion that cancer may perhaps be just another intelligible natural process whose cause is to be found in our environment and mode of life."

With this sentiment that might have come from Tanchou in 1843, or from any of the medical missionaries, I shall postpone to another chapter further consideration of the Berglas work and turn to the last distinguished proponent of the view that a cure for cancer is not to be expected from the kinds of researches that have occupied the professionals since 1900.

Sir Macfarlane Burnet is the director of the Walter and Eliza Hall Institute for Medical Research in Melbourne, Australia. He returned on August 26, 1958, from various medical conclaves and was interviewed in Sydney by United Press International:

"It is highly improbable that a cancer cure ever will be found, Sir Macfarlane Burnet, world famous Australian scientist, said today on his return from cancer conferences in London, Stockholm and Toronto.

"I do not want to be discouraging; but when it comes to cancer cures I am definitely a sceptic," Burnet said. ... "It is foolish to talk of a cure being just around the corner."

But although these authorities are pessimistic about the major trend in cancer study since 1900, which has been aimed at finding a cure, many of them are hopeful along nineteenth-century lines, namely prevention. That this was the main conclusion of the London conference of 1958 is indicated in a summary published on July 26 of that year by *Science News Letter* of Washington, D.C. Under the heading STRESS CANCER PREVENTION comes a subhead, "The Emphasis in Cancer Research May Soon Turn ... to Ways of Preventing Its Occurrence." This is summarized:

“Moving from the diagnosis and treatment of cancer into how to prevent its occurrence, was the major step forward taken by the Seventh Congress, Dr. C. P. Rhoads, director of the Sloan-Kettering Institute in New York, said.”

Along the lines of hope in prevention indicated by Dr. Rhoads, I shall sketch some of the many ways in which the twentieth century has been rediscovering the nineteenth.

16. The Twentieth Century Rediscovered Nineteenth

To the medical missionaries it would seem that Cope, reviewed a few pages back, explains just why Europe forgot Tanchou and why North America went sound asleep after the nineteenth-century awakening through Le Conte's efforts as chronicled by Hoffman in his books of 1915 and 1937.

Later in the present chapter, when the already quoted work of Dr. Berglas is taken up in greater detail, it will appear that things were indeed in a bad way when Dr. Cope was writing his *Cancer: Civilization and Degeneration*. But even as he published this book, in 1932, the rediscovery of the nineteenth century's approach to cancer was already in process, and in several parts of the world. With a bias resulting from my own study, I would have preferred to find the old belief returning to Europe through a resurrection of Stanislas Tanchou's memoir addressed in 1843 to the French Academy of Sciences. Or I would have liked the revival to come from the frontier doctors, perhaps from Alaska's beloved Dr. Joseph Romig or from the world's darling of music and medicine, Dr. Albert Schweitzer.

But the revival actually came simultaneously from many lands, and arose from none of these sources. In most places the revival seems to have stemmed from an unheralded rolling away of some stone from the door of a sepulcher of tact. In one case those who did the unrolling hailed from two countries, Britain and Denmark. The story is told in an article in the *Danish Medical Bulletin* for May 1955 on "The Danish Cancer Registry," by Dr. Johannes Clemmesen, the registry's director:

"In 1937 [thus five years after the publication of Cope's book] Kennaway and Kennaway ... [reported] that mortality statistics from England and Wales had revealed differences in mortality from cancer between various social classes.

"Contrary to the expectations of the writer, his subsequent studies of cancer mortality among Danish breadwinners, of various occupations, confirmed that also in Denmark differences could be demonstrated between certain occupational groups, and between the capital, provincial towns and rural areas."

On the principle that every effect has a cause, the obvious method was to record for every cancer victim everything conceivably pertinent about his ancestry, and about his life up to the time when the cancer struck. "It was therefore suggested by the author that continuous registration should be made of all cases of cancer in the Kingdom of Denmark ... On May 5th, 1942, the Danish National Anti-Cancer League opened a National Cancer Registry."

Evidently Dr. Clemmesen had been feeling, much as Dr. Cope did, that cancer research had swung too far away from the comparative study of groups of peoples who have little or much cancer (endemiological research), and too exclusively toward animal experimentation — the artificial production of cancers in multitudes of small beasts, directed toward discovering, if possible, before or after they die, how to slow up or stop the deadly course upon which the creatures have been launched by the experimenters — a launching with the laudable purpose of finding out how to alleviate or cure malignant disease in humans, but with the deplorable actual result that, in fifty years and after hundreds of millions spent, we have not improved our skills in fighting cancer enough so

that the annually increased number of cancers contracted is balanced in the mortality statistics by the annual number of deaths prevented. Like Dr. Cope, Dr. Clemmesen feels that this too great swing away from endemiological research took place around 1900, for he says:

“While experimental cancer research, since the beginning of the present century, has appealed successfully to the public for means to ‘solve the riddle of cancer’ and to ‘find a cure for cancer,’ the endemiology of neoplastic disease has been neglected.”

This neglect, Dr. Clemmesen feels, has not only been specifically but also generally out of line with the history of medicine, especially as pertains to medicine's great advances. He cites historically well-known studies, such as he favors, that resulted in the alleviation and even the elimination of previously serious diseases. He urges that we now make active use of “the collection of information on the distribution of malignant disease, among various ethnological groups in different regions, in relation to any relevant focal factors.” This is, of course, what the medical missionaries have been urging right along.

Says Director Clemmesen: “Viewed in relation to the possibilities for obtaining new information on human cancer, an institute for endemiological research in cancer will be far less expensive than the more popular and common institutes for experimental cancer research, mainly because advantage is taken of the biological information collected in hospitals and medical practice at enormous cost in human suffering and money, primarily spent with a view to curing the patients ... [the Danish cancer registries gather facts from which we are able] to draw conclusions from the ‘experiment’ which Nature, and we ourselves, are carrying out on mankind.”

In 1957, two years after Dr. Clemmesen thus described a British and Danish return to approximately the nineteenth-century view of cancer, came the already touched-on work of Dr. Berglas, now to be reviewed in more detail.

Cancer: Its Nature, Cause and Cure has four prefaces. The first, by the author himself, and the second, by Dr. Albert Schweitzer, have already been quoted, if too briefly.

In the third preface Dr. Antoine Lacassagne, vice president of the Cancer Research Foundation of the Pasteur Institute, supports Dr. Berglas in his contention that the cancer situation of civilized man is still going from bad to worse. “On the one hand, in spite of the progress of local therapy, and the increasing efforts of propaganda to aid in the fight, the rapid increase of the disease is a given fact ... the search for a general cancer therapy ... has led to failure.”

The fourth preface, by Professor Dr. Hans Lettré of the Institute of Experimental Cancer Research, Heidelberg, in approvingly summarizing the book, says: “Dr. Berglas emphasizes that the progressive artificialization of the environment of man — to which the human organism fails to adapt — may be an essential cause factor in carcinogenesis.”

In the body of his text Dr. Berglas reiterates that “there is yet no remedy for cancer,” that it is not infectious, and that cancer is the most frequent cause of death in highly developed countries (if we exclude death due to wear and old age). He concludes that “every one of us is threatened with death from cancer because of our inability to adapt to present day living conditions.” Civilization, he feels,

is in terms of cancer a Juggernaut that cannot be stopped.

But later I shall quote others who, though they agree with Dr. Berglas on every other point, disagree with his feeling that it is impossible to bring about a change in food habits, and other ways of life, sufficient to slow materially the advance of cancer.

Under “Progress of Civilization and Increased Cancer Mortality,” Dr. Berglas says that “during the last fifty years, paralleling the progress of civilization, the frequency of cancer has increased ... in the future every human being will inevitably become a victim of cancer ... In 1900 statistics placed cancer eighth among the causes of death, whereas today [1957] it is placed second.”

Berglas feels that this worsening statistical effect is due in part to decreased mortality from nonmalignant disease — but not nearly so much so as the lay public would like to believe. He quotes Dr. H. E. Hilleboe, who has been the New York State Commissioner of Health since 1947:

“It is a common impression among lay people that cancer occurs almost entirely among older persons. Actually this is far from the truth. In ... upstate New York for the three year period 1950-53 ... malignancy ranked third as cause of death in 1-4 year olds, and was exceeded only by accidents and congenital defects. In other words, 12% of all deaths in this age group were caused by cancer. Among the 5-14 year olds malignancy ranked second to accidents as cause of death, and contributed 14% of all deaths ...”

Since neither accidents nor congenital defects are diseases, cancer was in upstate New York in 1953 the most often fatal of all young people's diseases, even during the first fourteen years from birth.

Under “Prediction of Cancer Mortality,” Dr. Berglas says the National Cancer Institute of the United States predicted (presumably In 1956) “that 32% of new born children are expected to contract cancer during their lifetime.” The same report states that 500,000 cases of cancer are being diagnosed annually [and also says that] “40 million of the population will contract cancer during their lifetime.”

Still on the topic of “Civilization and the Growing Menace of Cancer,” but now under the subhead “Defects of Nutrition,” Dr. Berglas continues: “... the more civilization has advanced, the farther we have come away from a natural diet ... Our present day diet consists to a large extent of adulterated and denatured foods, from which the most essential factors have been removed by coloring, bleaching, heating, preserving, etc. The visual impression of food often becomes more important than its value ... When we speak of diseases of civilization we are talking about diseases which, in many instances, could be corrected by proper diet.

“Attempts have been made to correct defects in nutrition by means of artificial compounds, such as synthetically produced vitamins. But it will never be possible to reconstruct a normal diet in this manner [a folly of which Dr. Berglas thinks the United States both one of the chief perpetrators and one of the chief victims] ... we agree with the [German] nutrition expert Kollath: ‘improper living and faulty diet constitute a lifelong preparation for cancer.’”

Dr. Berglas considers that “obese individuals contract cancer far more frequently than those of normal weight.” In this connection it should be pointed out that during the “cancer free” period among

the Eskimos of northern Alaska, there was no obesity (cf. the 1854 testimony of Dr. John Simpson, the 1883 concurrence of the anthropologist John Murdoch, and my own observation of the years 1906-14); but in the present period of high-cancer incidence, obesity is “normal” among the Barrow Eskimos — “normal” presumably meaning that obesity is now about as frequent there among Eskimos as it is among the resident whites.

Under “Carcinogenic Noxae in Food,” Dr. Berglas quotes German Dr. G. Schenk: “‘It is the nature and essence of industrial civilization to be toxic in every sense ...’” His own comment is that Dr. Schenk's “dictum applies above all else to those noxae in food and environment [e.g., smoke in the air, gas fumes] which we must recognize as deleterious to cells and hence as factors in carcinogenesis. The food we eat has, in a few decades, been so altered and contaminated with chemicals that every mouthful we consume contains traces of harmful substances ... it becomes understandable that nearly 50% of cancers in man occur in the gastrointestinal tract ...”

In a section too long and complicated for us to abstract, Dr. Berglas names, as carcinogenic, many things that have become standard in our diet during the period in which cancer has been gaining rapidly in its destructiveness — among these he includes sprays and other chemicals used in cultivating fruits and vegetables, dyes to make them look more attractive, various chemical food preservatives and also overhot foods and drinks, as well as “excessively toasted breads and biscuits, over-cooked meats ...” and otherwise chemically preserved foods, and canned ones.

That Dr. Berglas thinks overcooked meats provocative to malignant disease is reminiscent of a like opinion expressed by some of the best witnesses to the former absence of cancer among the Eskimos. For northern Labrador, for instance, Dr. Hutton comments: “In this connection [absence of cancer] it may be noted that ... most of the food is eaten raw ...” Similarly Dr. Romig, in telling about the “cancer-free” Eskimos of Temperate Zone Alaska around 1900, says that the food, while usually cooked, was boiled or roasted only to the degree we call medium or rare, and that foods and drinks were served lukewarm rather than hot.

Dr. Berglas emphasizes that there is nothing suddenly disastrous about the carcinogens in modern foods as there is with strychnine or botulism: “As a rule a relatively long latency period of carcinogenesis, often lasting several years, is observed in man.” But from this follows also that if we were to change this year from our dangerous food practices it might be several years, perhaps ten, before we could breathe freely on the score of cancer.

As to the contrast between “civilized” and “uncivilized” countries since 1900, Dr. Berglas says: “Accounts of regions free from cancer reveal the influence of civilization on the processes of cancer. This influence resides in the totality of civilizational noxae, i.e., stresses of chemical, physical, nutritional and environmental nature. We are faced with the grim prospect that the advance of cancer and of civilization parallel each other.”

In this section of his book *Cancer*, Dr. Berglas uses as his last subhead: “Are There Regions with Little or No Cancer?” He thinks there are, generally speaking; but he does not go far into this topic, and names examples only from the tropics and from the southern edge of the North Temperate Zone — does not mention any from the region which we have been specially studying, the northern edge of the North Temperate and the southern edge of the Arctic Zone. Berglas starts his brief listing of cancer-

free regions with northern India:

“In the secluded Karakorum ... live the Hunzas ... They are untrammelled by technological progress or industry. Their diet is simple and natural ... Sir Robert McCarrison, a surgeon in the Indian Health Service, observed a total absence of all diseases during the time he spent in the Hunza valley [seven years]. In particular, no cases of cancer came to his knowledge.” (This is dealt with further in Chapter 17 “The ‘Cancer Free’ People of Asia.”)

Next Dr. Berglas summarizes Dr. Schweitzer's statement, quoted previously as to how cancer was nearly or quite absent from Gabon, tropical French Africa, in 1913; how the people are now becoming severely afflicted; and how Dr. Schweitzer thinks this change has come about because the natives are now “living more and more after the manner of the whites.”

Dr. Berglas mentions that “Dr. Eugene Payne, who examined approximately 60,000 individuals during a quarter of a century in certain parts of Brazil and Ecuador, found no evidence of cancer. This was some time ago and it is likely that the inroads of civilization, together with its modern foodstuffs, may have altered the situation.”

A parallel to the just cited information of Dr. Payne regarding Brazil and Ecuador is given from Bolivia by our frequently quoted source, Dr. F. L. Hoffman. In 1923 he addressed the Belgian National Cancer Congress at Brussels. The text of his speech is available through an undated booklet, “Cancer and Civilization,” that was issued, presumably late in 1923, by the Prudential Insurance Company of America, at Newark, New Jersey. In connection with like testimony from numerous sources, Dr. Hoffman here quotes the renowned anthropologist of the Smithsonian Institution, Dr. Aleš Hrdlička, on primitive natives of the Americas: ““Malignant diseases, if they exist at all — that they do would be difficult to doubt — must be extremely rare.”” Speaking for himself, Dr. Hoffman then says:

“The foregoing observations have been emphasized by personal investigations among the Indians of Bolivia, among whom I was unable to trace a single authentic case of malignant disease. All of the physicians whom I interviewed on the subject were emphatically of the opinion that cancer of the breast among Indian women was never met with ... Hence the conclusion, supported by a large amount of additional evidence from primitive people throughout the world, that malignant diseases among native races are of extremely rare occurrence.”

At the close of his section, “Are There Regions with Little or No Cancer?” Dr. Berglas concludes: “These few accounts of regions and peoples free from cancer deserve attention, for they indicate a correlation between civilizational noxae and cancer.”

About the “correlation between civilization and cancer,” the medical missionaries (quoted throughout the present volume) could not agree more! And they would also more than agree with most of the rest of Berglas' book. In particular they would subscribe to the grim Berglas prognosis, reviewed a few pages back, which appears under the head of “Civilization and the Growing Menace of Cancer.” But, as I have already predicted, surely a majority of the frontier doctors would nevertheless disagree with the startling pessimism of Dr. Berglas' own page 63:

“We have to face the fact ... that no one can protect himself from cancer under present-day conditions.”

More nearly than agreeing straight out, the medical missionary would likely first agree to the gloomy premises of Dr. Berglas and then bring in a hopeful note, perhaps after the manner of the famous London physician, Sir Arbuthnot Lane, who pronounced darkly on cancer but then changed his tune, as frontier doctors often do. In his preface to the 1926 London edition of Ettie A. Rout's *Maori Symbolism*, Dr. Lane says, for example:

“There is something radically and fundamentally wrong with the civilized mode of life; and I believe that unless the present dietetic and health customs of the White Nations are reorganized, social decay and race deterioration are inevitable.”

But, like the typical frontier doctor, Sir Arbuthnot follows his “unless” with this famous rallying cry:

“I shall not die of cancer. I am taking measures to prevent it. What I am doing anyone can do. It is not a matter of money. It is a matter only of forethought and forbearance. What I am doing everyone should do if he would avoid the risk of death from a disease more terrible than syphilis ...”

Fashionable and respected, Sir Arbuthnot Lane died in 1943 at eighty-seven, an age which certifies that his way of life did not provoke an early cancer. As his words show, he was in agreement with the frontier doctors, quoted frequently herein, in believing that diet may advance or retard malignant disease.

But, while sharing the view that a right diet protects from cancer, Dr. Lane seemingly did not make an impartial valuation of frontier testimonies if they seemed to him contradictory. For instance, there was perhaps really equal reason to believe Dr. Robert McCarrison, who found no cancer during the years 1904-11 as an army surgeon among a certain large number of Hunzas in India, and to believe Dr. Samuel King Hutton who found no cancer during the years 1902-13 as a medical missionary among a comparable number of Eskimos in North America. But Dr. McCarrison's “cancer free” Hunzas ate little meat, Dr. Hutton's “cancer free” Eskimos ate little else but meat, and Dr. Lane was a vegetarian. Naturally he accepted for frequent quotation the Hunza evidence, but does not appear to have made use of that of the Eskimos.

With a bias for meat as strong as Dr. Lane's for vegetables, I have been equally partial. For nearly half a century, after being told by northern frontier authorities that uncivilized Eskimos never get cancer, I felt inclined to weigh such testimony as Dr. Hutton's and to dismiss unweighed the McCarrison variety. But now that I have finally spent some years comparing vegetarian with meat-eater evidence in relation to cancer, I have a hunch that both sides are right and both wrong — each right in praising its own diet but each wrong in condemning the other; both wrong in feeling that there is a necessary contradiction between them.

So, after giving at length the testimony of observers who searched vainly for cancer among 50,000 mainly or wholly carnivorous Eskimos in North America, I shall now present, at some length, the testimony of observers whose corresponding search is still going on in Asia among the largely vegetarian Hunzas.

17. A “Cancer Free” People Of Asia

“Cancer ... [is] unknown among them.”

This 1960 pronouncement, which shall cite later at greater length and in context, is ‘a new version of an old report that a seven-year (1904-11) medical survey of the native State of Hunza had failed to reveal a single malignancy. The population surveyed was then about 11,000 but is now more than 20,000; the author of the pronouncement was then a youthful agency surgeon but is now Major General Sir Robert McCarrison. Met at first with skepticism, his observations were repeatedly confirmed. Let me quote again from Dr. Alexander Berglas' half-century résumé of the case beginning on page 73 of his 1957 book *Cancer*, at the section entitled “Are There Regions with Little or No Cancer?”

“The question of whether civilization contributes significantly to the rise of cancer was studied among less civilized peoples.

“In the secluded Karakorum region of Asia, far from any civilization, live the Hunzas, among whom disease is almost unknown. The people living there are sheltered from the psychic and physical stresses to which men are exposed in more civilized areas. Their diet is simple and natural ... Sir Robert McCarrison, a surgeon in the Indian Health Service, observed a total absence of all diseases during the time he spent in the Hunza valley. In particular, no case of cancer came to his knowledge.”

Dr. McCarrison's own typical statement appears in his *Studies in Deficiency Disease* (London, 1921). After quoting, with approval, the famous Danish nutritionist, Dr. Mikkel Hindhede, to the effect that ““The principal cause of death lies in food and drink,”” McCarrison goes on:

“My own experience provides an example of a race, unsurpassed in perfection of physique and in freedom from disease in general, whose sole food consists to this day of grains, vegetables, and fruits, with a certain amount of milk and butter, and goat's meat only on feast days. I refer to the people of the State of Hunza, situated in the extreme northernmost point of India ... They have, in addition to grains — wheat, barley, and maize — an abundant crop of apricots. These they dry in the sun and use very largely in their food. Amongst these people the span of life is extraordinarily long; and such service as I was able to render them during seven years spent in their midst was confined chiefly to the treatment of accidental lesions, the removal of senile cataract, plastic operations for granular eyelids, or the treatment of maladies wholly unconnected with food supply.”

In November of 1921, some months after the London publication of *Studies in Deficiency Disease*, McCarrison gave at Pittsburgh the Mellon Lecture, published in *The Journal of the American Medical Association* (Chicago) for January 7, 1922, as “Faulty Food in Relation to Gastro-Intestinal Disorder.” The Hunza case is here dwelt upon at greater length:

“I propose in this lecture to propound the thesis that much of the gastrointestinal disorder of civilized peoples of the present day is due to faulty food. In doing so I shall present evidence of the incidence of such disorder among civilized communities and its comparative absence among certain races living under more natural conditions; and contrast, in general terms, the food habits of the former with

those of the latter ...

“For some nine years of my professional life my duties lay in a remote part of the Himalayas where there are located several isolated races far removed from the refinements of civilization. Certain of these races are of magnificent physique, preserving until late in life the characters of youth; they are unusually fertile and long lived and endowed with nervous systems of notable stability...

“During the period of my association with these peoples I never saw a case of asthenic dyspepsia, of gastric or duodenal ulcer, of appendicitis, of mucous colitis, or of cancer ... While I cannot aver that all these maladies were quite unknown, I have the strongest reason for the assertion that they were remarkably infrequent ... Their buoyant abdominal health has, since my return to the West, provided a remarkable contrast with the dyspeptic and colonic lamentations of our highly civilized communities.”

“Searching for an explanation” of this difference, McCarrison speaks briefly of the temperate use of alcohol and the salubrious results of an active life spent in large part out-of-doors; he discusses at length two other subjects:

“(1) Infants are reared as Nature intended them to be reared — at the breast ...

“(2) The people live on the unsophisticated foods of Nature ... I don't suppose that one in every thousand of them has ever seen a tinned salmon, a chocolate, or a patent infant food, nor that as much sugar is imported into their country in a year as is used in a moderately sized hotel of this city in a single day ... enforced restriction to unsophisticated foodstuffs of Nature is compatible with fertility, long life, continued vigor, perfect physique, and a remarkable freedom from digestive and gastrointestinal disorders, and from cancer.”

The nature peoples whom he has studied, McCarrison says, are healthy on simple and little-processed foods which are, in essence, “the protective foods, as McCollum has named them ... But the case is different with civilized man. No longer is he content with the unsophisticated foods made in Nature's laboratory ... To him these are ‘still for meat,’ but preserved, purified, polished, pickled and canned. Some he extracts and distills with the object of procuring concentrates agreeable to his taste ... One way or another, by dessication, by chemicals, by heating, by freezing and thawing, by oxidation and decomposition, by milling and polishing, he applies the principles of his civilization — the elimination of the natural and substitution of the artificial — to the foods he eats and the fluids he drinks. With such skill does he do so that he often converts his food into a ‘dead’ fuel mass ... he joins deficiency of some materials with excess of others...

“I am not for the moment concerned with the circumstances of his civilization — expediency, penury, prejudice, ignorance or habit — which have compelled man into this dangerous course. It is sufficient for my purposes that these circumstances exist, and that, in consequence of food habits they have fostered, normal bodily function cannot be sustained ... I often think that we are apt to assume more readily the office of salvors of wrecks than of pilots whose function it is to prevent them.”

McCarrison's views, as thus expressed in 1921, appear to be mainly the result of his own 1904-11 Kashmir experience. His observations and opinions, and those of other Hunza students before and

after him, have been reviewed frequently. It is unlikely, however, that anyone has done a more perspicacious job than Dr. G. T. Wrench in *The Wheel of Health* (London, 1938), which I shall cite, dwelling most on those testimonies and opinions of Hunza investigators which appear to have a bearing on our Eskimo ones, whether in general relation to health or in particular relation to cancer.

The first and perhaps most striking contrast in health between the two peoples is that the Eskimos were formerly quarantined by the uncrossed Atlantic from the contagious diseases of the Old World while the Hunzas were continually exposed to them — how exposed is made apparent in the opening paragraphs of *The Wheel of Health's* chapter, “The Hunza People”:

“Where India meets Afghanistan and the Chinese Empire and is closest to the Soviet Republics, there, amidst a congress of great mountains, is the Native State of Hunza ... There, in a profound cleft, between walls from ten to fifteen thousand feet in height ... the beautiful and highly cultivated sunny seven miles, which is the heart of Hunza, may, by its very remoteness, have sheltered primary truths of health which civilization has forgotten ...

“Fortunately many people have seen the Hunza folk, for their valley is the highway to the 15,600 foot wall which divides India and China ... Actually more than a thousand years ago an army of ten thousand Chinese did cross ... With this exception, these clefts have only been traversed by small groups of men. In modern times most of the European explorers, missionaries, and officials, on their way from India to Central Asia, take the Hunza route.”

That “Fortunately many people have seen the Hunza folk” is doubly true in that the early modern explorers published pencil sketches of them; and more recently travelers like the Lowell Thomases, senior and junior, have made available still photographs and moving pictures of them. Their physical prowess — their agility, strength, and endurance — had long been well known, through words and pictures. But not until McCarrison's time was their exceptional health and longevity appreciated, and especially not their success in resisting the many diseases to which they must have been exposed through living beside an international highway.

Wrench explains how he came to undertake that interpretation of McCarrison and the Hunzas which he presents. Speaking for himself as a young doctor, he asks: “Why was it that as students we were always presented with sick or convalescent people for our teaching and never with the ultra-healthy? Why were we only taught disease? Why was it presumed that we knew all about health in its fullness?”

Failing to enlist support for study of the healthiest people he could find, Wrench studied the sickly, completed his medical training, entered general practice, became an army doctor in 1914 for the duration of the First World War, and re-entered general practice. In his 1938 book he says that it “was not until two years ago, when I had more leisure, that a vivid sentence in the writings of Sir Robert McCarrison thawed my frozen hope. The sentence was: ‘These people [the Hunzas] are unsurpassed by any Indian race in perfection of physique; and are long lived, vigorous in youth and age, capable of great endurance and enjoy a remarkable freedom from disease in general.’”

At long last able to follow his bent, Wrench now devoted himself to the proposition: “By studying one of the healthiest peoples in the world we might so improve our methods of health as to become a

really healthy people ourselves.” As he discusses McCarrison's work and views, Wrench arrives at the belief that by following the Hunza way of life, or another one as good, Europeans could develop an immunity to many diseases, including cancer — an immunity, that is, equaling the Hunzas' own. That he is not going to summon Europe to a vegetarian crusade, however, he brings out on his page 100:

“The Hunza, with the exception of their occasional meat, are lacto-vegetarian feeders such as Hindhede and other nutritionists, including McCarrison, put as the healthiest diet of mankind. As a general diet it may well be so; though the polar Eskimos, with an entirely opposite diet, do not yield to the lacto-vegetarians in health and physical endurance.”

Since, in the view of Wrench, the almost exclusively meat-eating Eskimos do not yield to the almost exclusively lacto-vegetarian Hunzas in physical endurance and health, it may be useful to compare what Wrench says of the Hunzas with what our earlier witnesses have said of the Eskimos. I refer especially here to the alleged former Eskimo freedom from cancer and the alleged present like freedom of the Hunzas. I shall slant my comparison toward what Eskimos and Hunzas are reported to have had in common or lacked in common.

One of the most radical changes in the Eskimo way of life, of those that took place shortly before cancer was first detected among them, was that the practice of breast feeding their children over several years was replaced by the European custom of weaning after a few months. About the Hunzas, Wrench says that “their children were breast fed up to three years, it being considered unjust to the living child for its lactation to be interrupted by maternal pregnancy.” During these prolonged nursing periods, both Eskimo and Hunza youngsters were of course being introduced gradually to foods other than mother's milk.

The other foods to which Eskimo children were formerly introduced during the nursing period were meats, raw or underdone, masticated as necessary by the mother. On how this was done in Labrador in the years 1902-13, some two decades before native cancer was first detected there, I have already quoted at length Dr. Hutton, who said that “cookery holds a very secondary place in the preparation of food — most of the food is eaten raw and the diet is a flesh one.” Among the lacto-vegetarian Hunzas, when youngsters are being introduced to outside foods during the nursing period, apparently other milks are added to the diet, along with milk products, as well as predominantly raw fruits and vegetables. Wrench says:

“Looking through the diet, it will be seen that there is nothing strange to the westerner in the Hunza foods ... The difference lies in the *way* they are eaten and the *way* they are cultivated. It is upon these differences that the better health and physique of the Hunzas in major part depends ...

“... vegetables they eat raw when they can ... They are fond of raw green corn, young leaves, carrots, turnips; and as it were to exaggerate their veneration for freshness, they sprout their pulses and eat them at their first green. This eating of sprouting pulse or gram is widespread in northern India, and undoubtedly within it there is health which is not in the pulse itself ...”

I have said about the Eskimos, of the period before 1930, that only in some districts were they wholly carnivorous; in most districts they ate some vegetables, then nearly always raw, which ranged in

annual caloric yield from perhaps 1 per cent to at most 5 per cent. The like, in reverse, is reported from the Hunza. McCarrison said that those whom he knew ate a little goat meat on feast days. Wrench, doubtless because he supplemented McCarrison's information from other sources, both earlier and later, puts it this way:

“Meat is a rare pleasure to the Hunza, as it is with the Sikh, both of whom take it on the average every ten days ... Some get it once a month ... The reason for its scarcity as a food is that the animals are valued as dairy animals in a country where pasture and fodder are scarce ... Animal food is well liked and figures at feasts.” The meat is stewed so thoroughly that the heat “must destroy the factors in food without which scurvy results. The Hunza, however, get no scurvy, because the stew is only a part of their diet and an unusual one ... They also eat sun-dried meat raw, if it is fat and well flavored ...”

On his page 104 Wrench makes a digression, for which he apologizes. I do not omit the digression; for it bears on the northern medical missionary view that the introduction of European cooking weakened the previously robust health of the Eskimos. Of the Hunzas Dr. Wrench says:

“... heating, and particularly boiling, is the chief human sophistication of food. Its danger is that it destroys the factors grouped around vitamin C; and scurvy, either in its mild form of pallor and lassitude, or in its severe form of foul flesh and bleeding, results ...

“It has been argued by Mr. A. M. Ludovici in his admirable treatise, *Man's Descent from the Gods*, that the legend of Prometheus can be explained in no other way but by the scorbutic evils which followed the introduction of cooking. Prometheus brought fire to mankind and was punished by Zeus. For in the place of the pristine health of the people came woes and sickness, only to be alleviated by Dionysus, the saviour, who taught men how to ferment grape juice, ivy juice, honey, and to eat germinated grains ... it is known, of course, that these fermentations and sproutings, young life in fact, are particularly effective against scurvy.”

Wrench says that “at feasts ... the Hunza drink freely of their homemade wine ... So, in the matter of balance to cooking by home-brews and sprouting grams, the Hunza are no doubt better off than we.”

Quoting McCarrison, Wrench relates that “the Hunza are great fruit eaters, especially of apricots and mulberries both in fresh and dry state.” On his own, Wrench explains that “they do not cook their fruits.”

Wrench asks: “When should one begin a diet? ... The real answer to the question is that one should not oneself have to start a diet ... One ought to step into it as one steps into existence ... We don't start at birth ... The speck that is to become a human being becomes it through foods ... Food is primary ... A healthy mother, eating healthy foods, is then a prerequisite for a good start.” The Hunza child before its birth is nurtured by the healthy blood of the mother who makes it from the wholesome things she eats. Then, herself still eating the right things, she breast feeds her child for several years while gradually introducing it to an outside diet the sources of which may be vegetable or animal but should in any case be mainly raw and fresh. “The Hunza food comes straight from the gardenfield or the hillside. Its freshness is its excellence. The most valuable form of young green life ... is sprouting gram ... They eat it raw.”

Wrench thinks it should not be hard for Europeans to learn to eat germinating seeds as a fresher and more health-promoting

form of greens. But there will be difficulty, he fears, about increasing sufficiently the fresh and green element of British meals. "We inherited a hunters' and a pastoral dietary. The game ate the vegetation and our ancestors ate the game." Still he thinks there is a chance to increase for our material benefit the eating of things that are fresh, and raw or underdone. Many people already like salads and raw oysters, rare sirloins and roasts; and such people would take to what he thinks is the ideal form of food — raw meats such as the Eskimos formerly ate, and especially the best greens which to him are germinating seeds. "The sprouting beans of the Chinese emporium in Soho and the several Chinese restaurants in London are already popular."

At this point Wrench has brought down to 1938 the story which began with the 1904-11 observations and interpretations of McCarrison. That story has been continued for twenty-one more years, to 1959, by Dr. Allen E. Banik and Renée Taylor in *Hunza Land* (Long Beach, Calif., 1960). From that book were taken the opening words of this chapter, to which I shall now return in context.

On his page 173 Dr. Banik, who spent some time in the Karakorum, says of the people: "Their freedom from a variety of diseases and physical ailments is remarkable. Cancer, heart attacks, vascular complaints, and many of the common childhood diseases ... are unknown among them. I am convinced that the diet upon which these people have lived for centuries is responsible for the enviable good health they enjoy."

Dr. Banik is not a specialist in cancer, nor trained as an epidemiologist; but he is a lifelong reader of whatever he has been able to find about the Hunzas.

Finally he made a trip to West Pakistan, visited the people in their homes and conversed with them through interpreters. He also recorded what was told him by the fluently English-speaking hereditary ruler His Highness Muhammad Jamal Khan, Mir of the State of Hunza. Banik asked questions prompted by what he had read and seen. *Hunza Land* may therefore be regarded to an extent as native comment on the European scientific writings of McCarrison and his predecessors and successors.

Politically, and in other ways, the situation in 1959 had been a

good deal altered since Wrench wrote his book twenty years before. In food habits there has been little change as yet except that more grain is being imported, the population having increased. The quality of the imports does not match that of the homegrown products and the proportion of grains to vegetables and fruits has altered. Banik is concerned that disease may result. As yet, however, the health and longevity remain, in his opinion the best in the world.

From among the Hunzas of Asia, then, still come reports of investigators seeking cancer, and not finding it, such as used to come from among the Eskimos of North America. For today's account of what is history elsewhere, I shall review the health situation as described in *Hunza Land*, pausing occasionally to compare the Eskimos, as they are said to have been, with the Hunzas, as they are said

to be.

According to the testimony of our earlier chapters, medical missionaries to the Eskimos have considered the rawness of the latter's food an important factor in protecting against cancer. It is interesting to compare this with Banik's opinion that "About twenty percent of the food eaten in Hunza is cooked; the balance is eaten in its natural state." He goes into detail:

"Vegetables in season are eaten raw ... At home we eat a few raw vegetables (as in salads), but these healthy natives prefer food in the raw ... They get the full nourishment of the plant because it is altered very little in the transfer from soil to table. Even corn on the cob is eaten raw in the milk stage. They soak beans and peas in water for one or two days and then spread the seeds out on wet cloth in the sun. They are eaten raw when they begin to sprout ..."

Europeans have five chief ways to process food: by heat, chemicals, cold, drying, and fermentation. Of these the Eskimos and Hunzas alike minimize or avoid the first two, cooking and salting. Both processings have been thought carcinogenic by the medical missionaries quoted earlier, for instance by Hutton for Labrador and Schweitzer for Africa.

Of the last three methods, thought by many to be preventive of cancer, the first, freezing, was much used for half the year by the Eskimos but was not feasible for the subtropical Hunzas. High as their mountains are, the sharp night frosts of winter seldom last through the day and at any rate are not continuous enough for long enough to be of use in food preservation.

The second of the processing methods considered salubrious by northern medical missionaries, sun drying, used by the Eskimos for preserving meat, was used by the Hunzas for preserving their vegetables, especially their fruits. In this chapter I have already quoted McCarrison: "They have ... an abundant crop of apricots. These they dry in the sun and use very largely in their food." This Banik confirms a half century later and testifies that when fresh fruit is not in season apricots, which have been dried in the sun, are soaked in water overnight, and that the fruit "resumes its original size and is just as sweet and delicious as the day it was picked."

The last of the five European processing methods, and the third of the ones considered by northerners as antiscorbutic and therefore presumably anticarcinogenic, is fermentation. Eskimo food being mainly flesh, the "young life," so highly praised by Wrench in relation to the Hunzas, is available to the northerners only as the microorganisms which produce decay. Now while most peoples of the world are fond of something rotten in their food, there are few countries where people enjoy whole meals of it. The foods that smell to high heaven, because of their active microorganisms, are normally used in small quantity at the end of big meals, as we use our strong cheeses — as the British use their Stilton, the French their Roquefort, the Belgians their Limburger, the Norwegians their Gammelost, the British Columbia Indians their candle fish, and the Eskimos their herring.

Banik's experience confirms what Wrench had to say about the Hunza way of promoting enjoyment of meals, and their enjoyment of a long life, through drinking quantities of "young life" in their fermented wines:

"Hunza wine, which I occasionally sampled ... had a pleasant mild taste that belied its potency ... I

found two glasses more than sufficient." Banik asked the Mir if his people ever became intoxicated from drinking Hunza Pani. "He shook his head in the negative. 'Do they drink it freely,' I insisted, 'more than two glasses at one time?' 'Why, of course,' His Highness answered me. 'On festival nights they drink it by the bottle, and every day it is a normal part of their meals ... Perhaps that is why we are known as the healthiest and happiest people in the world!'"

By the testimony so far reviewed, then, the Hunzas go easy on those two of the five main European methods of food processing which northern medical missionaries think carcinogenic, heat and chemicals (cooking and salting). The first of the supposedly wholesome processings, freezing, they have used little, if at all. The second wholesome method, sun drying, the Hunzas employ even more extensively than the Eskimos (or the northern Athapaskans). The third of the salubrious methods, fermenting, they also use more extensively than the Eskimos.

Banik's evidence also supports McCarrison and Wrench in the matter of breast feeding. With marked similarity to the former Eskimo practice of prolonged breast feeding, "male [Hunza] children are nursed by their mothers until the age of three (girls to the age of two) ... it is the belief of the people that a long nursing period gives the youngster the best possible start in life."

Elsewhere Banik speaks of the favorable status of women among the Hunzas. He does not say that Hunza girls get a worse start than boys through having one year less of mother's milk. But such a comment may be implied in a question-and-answer exchange on page 225 of *Hunza Land*: "Q. Do Hunza women outlive their men as is customary in other countries? A. The contrary is true in Hunza. Men outlive the women by an average of about five years."

Related to the long nursing periods, no doubt, would be a wide spacing of pregnancies; for it is a common belief that active lactation tends to inhibit conception. Among the Hunzas, Banik says, "intervals of two to five years are customary between births."

That was how it used to be among the Eskimos, as mentioned by a number of the authorities quoted — such as John Simpson in 1852-54, John Murdoch in 1881-83, and especially the Presbyterian medical missionaries R. H. Marsh, 1897-1912, and H. W. Greist, 1921-37. These, among others, agreed that they found nursing periods varying from two to five or more years — the births usually, not always, corresponding.

But, as quotations from these authorities have shown, Europeanization of North American Eskimos became progressively heavier after 1920, especially as pertains to food. During the period 1920-40, Eskimo women were learning from white women to substitute canned milk and "formulas" for breast feeding, and to wean after a few months instead of a few years. A baby each year became the usual result. In 1956 Dr. G. E. MacGinity wrote from Point Barrow to the British scientific journal *Nature* (November 17, 1956) that formerly "Eskimo women became pregnant only once in several years"; but since the Europeanization of their way of life "birth rate is increased as much as threefold" and "they bear a baby every year."

Longevity, the end product of good health, is believed by many to have been high formerly among the Eskimos; it is apparently known to be so still among the Hunzas. Banik says (p. 25) that they "today live in health and happiness to the age of 120 years ... the healthiest, longest-lived people in the

world.” He is sure (p. 143) that “the Hunzakuts do not consciously follow any regime designed to ensure long life.” He is sure (p. 147) that “the people of Hunza do not rely on drugs.” He is sure (p. 174) that cancer is unknown among them.

He is worried, however, about the future (p. 237): “... the Hunzakuts, a unique race, enjoy a much longer life and a much healthier one than is customary. In my opinion the Hunzakuts would live even longer if they had more land and more natural fertilizer. At present the country is over-populated and it is necessary to import food. The population is now over 25,000; fifty years ago it was 7,000. Disease will result from eating deficient foods, and the life span of the people will inevitably be shortened. Presumably Hunza will go the way of all civilizations.”

As for fortifying the deficient imported foods with substances like vitamins, Dr. Banik takes a position similar to that of Dr. Berglas in France, that food boosters, such as vitamins, do not serve adequately to improve a diet. On the use of chemical fertilizers to increase crop yields, he says: “Commercial fertilizers are forbidden by law.”

Writing as the Canadian government's chief Eskimo specialist, Dr. Diamond Jenness said of the Stone Age Eskimos: “Among adults, death was nearly always due to ... either old age or the perils that are inseparable from life in the Arctic ... the natives were remarkably healthy.” Similarly Banik answers the question (p. 223), “If Hunza is disease free, how does death come?” as follows: “Like the ‘one hoss shay,’ all the Hunzakuts' bodily organs seem to expire at one time. One day the oldster is there; the next day he is gone.” On the same page he says: “There are many ‘elders’ in Hunza ... I would say the oldest man is 120, although it is said that some have lived to 140 years.” Elsewhere he says that modern investigators have found the I. Q. high; and on page 210 he says:

“The Hunza people have become a legendary saga, a mystery to the rest of the world, because they mastered the secret of old age. They live long and remain youthful in mind and body until they die. There are some people who live to be ninety or one hundred in our country, too, but they are such a minority that few of us know about them.”

Among the foods considered responsible for the high average longevity of the Hunzas, Banik dwells on cereals which are eaten in whole-grain form. He lists about the same vegetables as McCarrison and Wrench and adds that there is “some meat (generally mutton) and milk products.” He mentions “sweet and sour milk, butter and cheese. Goats and sheep supply most of the milk. All nutriments are preserved because pasteurization is unknown among the Hunza.”

On page 200 he stresses for the lacto-vegetarians a matter that has been considered important in explaining the reported former good health of the meat-eating Eskimos, namely that their diet prevented constipation. Among the Stone Age Eskimos of Coronation Gulf, most of whom had not seen Europeans even from a distance until Dr. Jenness and I came to live among them (I for a year, 1910-11, and he for two years, 1914-16) constipation was known only as an accompaniment of famine, considered chiefly due to a lack of fat foods. On constipation Banik says: “While the importance of good nutrition cannot be over-emphasized, there is another factor that contributes to radiant good health. Complete elimination is an absolute essential. Constipation, ‘the father of human disease,’ so prevalent in our country, is utterly foreign to the people of Hunza.”

Banik does not think it would be a hardship for us to attempt reaching the Hunza quality of health through adopting a suitable variant of the Hunza diet. He says that “organically rich foods are so superior that, once they are tried, the ‘old diet’ will seem insipid and unattractive. I shall never forget the natural sweetness and marvelous taste of the fruits and vegetables I enjoyed in Hunza.”

And Banik may himself try it, for he says on page 175: “My attitude towards eating changed radically after I observed the Hunza way of life. I realized that it is time for the Western world to awaken to facts and do something about changing its ‘civilized’ habits.”

Hunza Land, in its cumulative message, is in accord with the poet Horace who expressed himself 2,000 years ago on Roman “civilized” feeding; and who is quoted with approval by Roger Bacon in the thirteenth century to the effect that for attaining health it is simple and natural foods which matter. I quote from Bacon's book, *The Care of Age and the Preservation of Youth*, translated from the Latin by Dr. Richard Browne and published at London in 1683:

“How can it be that he who either is ignorant or negligent of Diet should ever be cured by any pains of the Physician, or by any Virtue of Physick? Wherefore the Physicians and Wise men of old time were of opinion, That Diet without Physick sometimes did good, but that Physick without due order of Diet never made a man one jot the better.”

18. An Ounce Of Prevention

This study of frontier cancer beliefs has reached the stage of summary and conclusion. I shall sift the testimonies and theories that have been presented by the medical missionaries I have been able to reach, and by other frontier doctors.

The witnesses are nearly unanimous in thinking that cancer is a disease of the civilized — that it remains rare, if not absent, until natives have been civilized enough for long enough, whereupon it becomes as frequent with them as with us.

Frontier doctors have consistently believed that natives might retain whatever immunity they possessed if they kept to the way of their fathers. They have believed that we who are already civilized could gain a corresponding relative immunity if we would do two things — if we discarded those European ways that will be found, upon study, to predispose to cancer; and if we acquired such native ways as are going to be found, upon like study, to have a beneficial tendency.

What this book has quoted from medical missionaries indicates that many of them believe they already have valuable clues, and that some think they possess real information about helpful details of the native way of life and the particularly harmful elements of ours. Could we, then, partially safeguard or wholly protect natives by getting them to refrain from the more carcinogenic practices of Europeans?

As for the civilized, can they be induced to adopt those native ways which seem to hold the greatest promise of relieving our communities from the steadily mounting threat of cancer?

As for getting already civilized natives to revert, past experience has made the missionaries pessimistic. We Europeans are so numerous on most frontiers, so wealthy and powerful, that our behavior patterns have become fashionable. And among primitive peoples, even more than with us, being in fashion is a controlling motive. Short of military-type regimentation, the only chance of getting natives to return to their former ways is for an influential number of whites to go native in the right way. If the aboriginal way of life were thereby shown to prevent or even materially lessen cancer among us, the adoption of certain primitive manners and customs might become fashionable enough with us to become fashionable also with civilized natives.

Medical missionaries are likely to be optimistic about the prospect of whites going native. They have known a great many Europeans to do it for what missionaries regard as unworthy motives, and they do not see why mere worthiness of motive would prove too restraining. Besides, many frontier doctors have themselves gone native in foods and other elements which they suppose to be preventive of cancer; and many of them have liked doing it. For instance, the head of the Presbyterian medical establishment at Point Barrow, Alaska, Dr. Horatio R. Marsh, whom this book has several times quoted, dressed Eskimo style, liked Eskimo food, and approved of the naked Eskimo winter living which we have described. South Sea missionaries, particularly some Mormons of long experience, have enjoyed and approved the corresponding native life of the tropical islands.

Alaskan and northern Canadian missionaries, with whom this book so largely deals, have had little to

say of cures for cancer except to wish those well who seek them. Believing that their experience has proven some of the means by which death from cancer may be made less likely, or even prevented, and favoring the maxim that an ounce of prevention is worth a pound of cure, they have emphasized prevention. Some of them have felt that they had a mission, a gospel of glad tidings, with three chief commandments which they were compelled to preach.

1. Learn how men formerly lived where diligent and competent search for generations has revealed little or no cancer.
2. On the frontier, pay heed to what the changes were that took place through the several decades which preceded the first detection of cancer, and to those changes which took place thereafter during the rise of cancer toward its present dread frequency.
3. Likewise, in our cities and rural communities, observe how those groups now live who are least afflicted by cancer, and how those live that are most afflicted.

These commandments, taken together, mean recommending to others the study of a field the medical missionaries themselves have been cultivating from early times. Substantially the commandments point toward a program similar to that described in an earlier chapter from the writings of Dr. J. Clemmesen on the Danish Cancer Registries, of which he is the head — indeed similar to the studies he describes as having been carried out in Britain by Kennaway and Kennaway during the 1930's; similar also to those made by General McCarrison in northern India in the 1920's, and to those begun in northern Alaska by Captain Leavitt during the 1880's; similar also to those advocated by President Le Conte of the University of California from 1846 to 1888, and suggested by Stanislas Tanchou to the Immortals of France in 1843. This is also the program suggested by implication by the witnesses quoted in Chapter 16, “The Twentieth Century Rediscovered the Nineteenth.”

During the nineteenth century and early twentieth many frontier doctors from many countries described or indicated diets which they believed had been the means of protecting their native communities against malignant disease. Also, by implication or explicitly, they warned against those European diets which they blamed for having recently destroyed native immunities. I shall now proceed to condense, from earlier chapters, some of their outright or implied suggestions, some of their implied and explicit replies to pertinent questions.

Are there regions with little or no cancer? That there are, or have been, is the reply from all zones equally, from tropic to arctic lands. To emphasize the authoritative nature of these pronouncements it will be helpful to repeat, in abridged form, four of the replies previously given at greater length and in context. (See the Index, under the names of the witnesses, for the extended references and the documentation.)

From the tropical frontier Dr. Albert Schweitzer wrote in 1957: “On my arrival in Gabon, in 1913, I was astonished to encounter no cases of cancer ... I can not, of course say positively that there was no cancer at all; but, like other frontier doctors, I can only say that if any cases existed they must have been quite rare.”

For the Temperate Zone native State of Hunza, Dr. Robert McCarrison said in 1922: “During the

period of my association with these [Himalayan] peoples I never saw a case of asthenic dyspepsia, of gastric or duodenal ulcer, of appendicitis, of mucous colitis, or of cancer ... While I cannot aver that all these maladies were quite unknown, I have the strongest reason for the assertion that they were remarkably infrequent.”

For the subarctic district of Labrador, Dr. Samuel King Hutton wrote in 1925: “Some diseases common in Europe have not come under my notice during a prolonged and careful survey of the health of the Eskimos. Of these diseases the most striking is cancer.”

For primitive man throughout the world, but with special reference to the Americas, Dr. Aleš Hrdlička of the Smithsonian Institution said: “Malignant diseases, if they exist at all — that they do would be difficult to doubt — must be extremely rare.”

Are these districts permanently cancer free? Here our witnesses answer nearly unanimously in the negative. Indeed, excepting the witnesses from the State of Hunza, most of those who have proclaimed their belief in a former absence of cancer would now parallel Dr. Schweitzer when he says of his tropical district: “In the course of the years we have seen cases of cancer in growing numbers in our region.”

Does the issue of cause lie between meat eating and vegetarianism? Many frontier doctors, true, have warned against meat as probably tending to be carcinogenic, and among these is McCarrison. But many have also pointed out that during the time of alleged freedom from cancer the Eskimos were living on a predominantly flesh diet. Hutton is typical of these when he says: “I have not seen or heard of a case of malignant new growth in an Eskimo. In this connection it may be noted ... that the diet is a flesh one.” It appears that when frontier doctors could find no cancer among vegetarians they were prone to warn against meat, and that where no malignant diseases were discovered among meat eaters there was a tendency to caution against mixed or vegetarian diets. If the testimonies quoted in this book are reviewed, the conclusion will be similar to that quoted from Dr. G. T. Wrench's *The Wheel of Health*:

“The Hunza ... are lacto-vegetarian feeders such as Hindhode and many other nutritionists, including McCarrison, put as the healthiest diet of mankind. As a general diet it may well be so, though the polar Eskimos, with an entirely opposite diet, do not yield to the lacto-vegetarians in health and physical endurance.”

What is the frontier doctor's view on cancer prevention? The most general conclusion, from a review of the testimonies and opinions of those I have been able to reach, appears to be that relative if not complete immunity to malignant disease is a byproduct of good health. The peoples believed to be free from cancer were believed also to be long lived and to die eventually of old age, in the sense that they did not appear to die of any specific trouble but just from wearing out. The Coronation Gulf Eskimos, for instance, among whom no cancer had been reported up to 1936, are described in *The Copper Eskimos* by Dr. Diamond Jenness: “Amongst adults, death was nearly always due to natural causes, either old age or the perils that are inseparable from life in the Arctic.” Dr. Henry W. Greist, in his *Seventeen Years with the Eskimos*, speaking of the ancestors of those north Alaskans among whom he was first able to diagnose cancer in 1933, says that “the Eskimo of the far North was healthy ... He lived to a very great age.”

How may cancer-resistant health be attained? The most detailed answers to this question, of those I have seen published, come from the Hunzas, who have been alleged to be free of cancer at least from the time of McCarrison's investigations of 1904-11 to those of Banik in 1959. An abridgment and paraphrase of these explanations has been given in Chapter 18, on "The 'Cancer Free' People of Asia." The general answer there is that the health of the Hunzas enables them to live, free of most diseases, till they collapse like the one hoss shay, though not at "a hundred years to the day" but more likely at around 110 or 120.

To plan for longevity, what is the most important period? As McCarrison's interpreter, Wrench, says, the crucial spell is the months before birth. "The speck that is to become a human being becomes it through food ... A healthy mother eating healthy food is then a prerequisite" for the healthy tissues and organs, including teeth and other hard parts, with which people like the Hunzas (by the testimony) live their fivescore years and ten as easily as we manage threescore and ten.

The second key to being "vigorous in age as in youth," according to Wrench, is protracted breast feeding, while the right outside foods are being introduced to the child's diet gradually. It looks as if McCarrison himself might have placed the long breast feeding first among the keys to health, for he named it first in the sequence of prime requirements in his Mellon Lecture of November 18, 1921. He then said, speaking of the Hunzas whom he regarded as the healthiest people in the world, that "their buoyant abdominal health has, since my return to the West, provided a remarkable contrast with the dyspeptic and colonic lamentations of our highly civilized communities. Searching for an explanation of this difference in incidence of gastro-intestinal disease in the two peoples, I find it, in the main, in four circumstances [of which he discusses at length only two]: (1) Infants are reared as nature intended them to be reared — at the breast ... (2) The people live on unsophisticated foods of Nature ..." Elsewhere we learn that "The Hunza mother gives the breast for three years. She nourishes the child and protects herself from pregnancy. To become pregnant during lactation is considered unfair to the suckling child ... The breast milk of the Hunza women must unquestionably be of excellent quality."

On this element of baby rearing, in the period when cancer was found among whites but not yet among Eskimos, Hutton says that "European mothers resident on the Labrador coast find themselves unable to suckle their babies — the breasts are full of milk for a few days after birth, and then the supply ceases — the result, no doubt, of the preponderance of tinned and dried foods in the dietary of a European resident. The Eskimo mothers suckle their babies, often for two years: the milk supply is plentiful and the babies grow fat and strong ..."

The third key to Hunza disease resistance and longevity, in the McCarrison-Wrench view, is the preponderant use of fresh and raw foods, with the minimum of processing. These two authorities speak in general terms; Banik is specific in pointing out that raw food constitutes 80 per cent of the dietary. Wrench emphasizes the special value to the Hunzas of "young life," the eating of this priceless commodity in uncooked germinating seeds and the drinking of it in the form of the bacteria that produce fermentation.

In relation to Eskimos of the old dispensation, Hutton suggests special anticarcinogenic values in raw flesh foods, as I should like to emphasize here by again quoting: "I have not seen or heard of a case of malignant new growth in an Eskimo. In this connection it may be noted that ... most of the food is

eaten raw.”

Negative anticarcinogenic values are attained by not doing what are considered the wrong things. Cooking was at a minimum among the Eskimos, formerly; and among the Hunzas less than 20 per cent of the food is cooked today, according to Banik's testimony for 1959. Formerly the Eskimos avoided salt scrupulously; the Hunzas go easy on it still. As to the stewing of meat by the Hunzas, McCarrison and Wrench indicated that cooked foods are so small a part of the whole diet that scurvy never appears. Many frontier doctors considered that whatever was antiscorbutic was also anticarcinogenic.

Maladies said to be rare when cancer is difficult to find have been mentioned in quantity and with remarkable unanimity by those familiar with frontier conditions.

1. Appendicitis was reported never found among unmodernized Athapaskans or Eskimos of southwestern Alaska during the first four decades following Romig's arrival there in 1896. Hutton reported similarly from the Labrador Eskimos for the years 1903-13. As to the Gabon section of tropical Africa following 1913 Schweitzer says: “... I vividly recall the 27th of April, 1954. That day we performed our first surgical operation on a black native.”

2. Constipation was formerly so rare on the northern coast of North America that it was looked upon as not occurring except when some accident or a famine made fat meat unavailable. Its rarity is still being reported from the Hunza section of the Himalayas.

3. Corpulence was not observed on the northern coast of Alaska, even among middle-aged women who were eating constantly through the largely house-confined idle period of winter, as reported by Simpson in the 1850's, by Murdoch in the 1880's, and by me between 1903 and 1914. It is, however, as common there now as among resident whites. The rarity or absence of corpulence is still being reported from the Hunza region.

Among the other difficulties said to have been rare or absent in the time of Eskimo primitive living these troubles have been mentioned frequently: arthritis, asthma, beriberi, caries (dental), colitis (mucous), diabetes, duodenal ulcers, epilepsy, gall stones, gastric ulcers, hypertension, night blindness, pellagra, rickets, scurvy.

How acceptable are frontier suggestions for cancer prevention? The first suggestion of Wrench, that couples start out in marriage to eat the foods he recommends may go a bit against the grain; and so may McCarrison's first, that children should be breast fed for three years. But the third suggestion is already popular, that something like 80 per cent of our food should be raw or underdone. Salads composed largely of fresh and raw vegetables and fruits are widely enjoyed, and many are already particular at breakfast that their orange juice shall have been squeezed no more than a few minutes before, discovering that it tastes better that way and having been told by the doctor that it has a higher vitamin C potency in that condition. Many would rather have their breakfast eggs soft-boiled than hard, and at no meal is it much of a hardship to have oranges served instead of orange marmalade or fresh strawberries in place of strawberry jam.

By the frontier doctor prescription, at lunch and dinner you would have your oysters and clams more

often in a cocktail or on the shell than baked or in a soup or stew; your roasts and sirloins would be on the rare side, or medium, and your desserts would tend toward fresh fruits and things like yogurt. To be avoided might be New England boiled dinner, corned beef and cabbage, ham, sausage, and too lean bacon, and anything cooked to death, preserved by any chemical, canned, or preserved in jars. And even with these you could satisfy a hankering now and then, on the principle that the Hunzas have avoided cancer, and such diseases as rickets and scurvy, on a diet that has included 20 per cent of cooked foods and a moderate use of salt. So there appears to be a good deal of freedom through diluting the suspect dishes with those which are given a carcinogenically clean bill of health.

The typical frontier doctor would think of these preventive regimens as merely something to start with and to improve upon through any and all the techniques of research in public health, medicine, and nutrition. And of course, as heretofore, he would continue to wish well those who in the meantime seek a cure for cancer.

The End