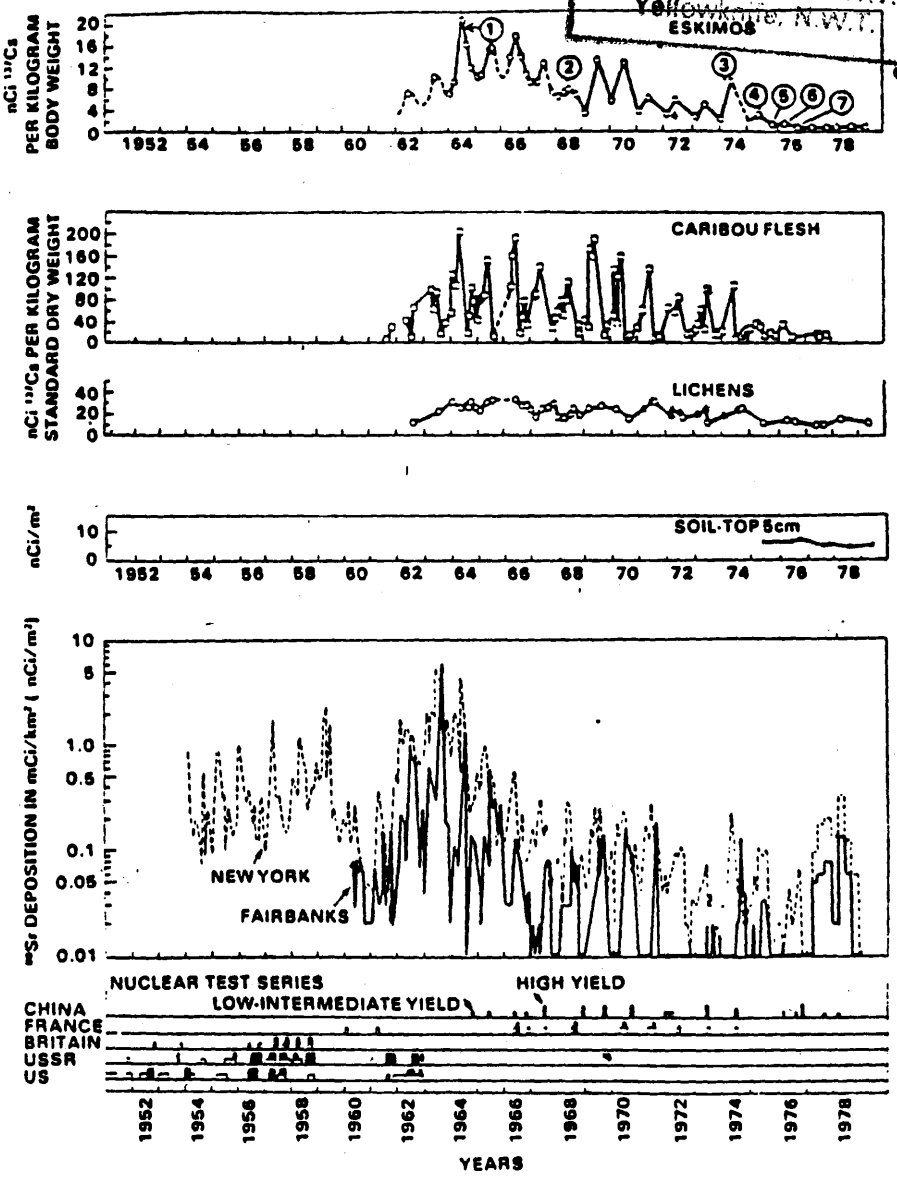


Fig 1. Fallout cesium-137 deposition in New York City and Fairbanks, Alaska, and subsequent concentrations in soils and biota of northern Alaska ecosystems during 1962–79. A previous period of fallout deposition and ecosystem cycling in the lichen-caribous-Inuit food chain during 1952–58 is inferred from measured deposition in New York City, the relation to similar data from Fairbanks, and ^{137}Cs concentrations in Alaska lichens during 1959–62. (Hanson 1982.)

Each Peak of Radiation in people could have been avoided.

(MISCALCULATED CARIBOU. FOOD CONSUMPTION)!

This is the direct translation of a french report. Done by Environment Canada in 1972. Titled: " Canada and its Environment ".....
A report of the Government of Canada at the Environment Committee organised at Stockholm, Sweden, by the United Nations, June 1972.

3.11 Radioactive Cesium in the Canadian North

Radioactive cesium (Cs-137) is one of the persistent sub-products resulting from nuclear arms tests. This isotope with others have been largely spread throughout the Northern Hemisphere especially between 30 and 60 degrees of latitude.

Because of its chemical characteristics, Cesium 137 is absorbed quite readily into northern vegetation, it is found in the lichen-caribou-man food chain.

Special Canadian studies were initiated in 1963 by the Health and Welfare Ministry. Preliminary measurements revealed that Cesium 137 was as high as 35 nanocuries per pound in fresh caribou meat {[2849 becquerels per kilogram]}. Regular urinalysises of people from 25 Northern Communities gave an average of 4 nanocuries per litre between 1964-1967 {[148 becquerels per litre]}.

Newer bomb tests have given far less fallout than before the nuclear test ban treaty and levels (of radiation) observed are decreasing gradually. Canada is looking for a similar type of treaty, in order to control the dumping of radioactive material in the atmosphere, as it is quite efficient and necessary.

Annual surveys have been done from 1965 to 1969 in Esquimo communities in order to reveal whole body content of cesium 137, with the help of a "whole body counter". These tests showed that these people had 20 to 100 percent more cesium 137 than southerners; individual values exceeded 4 microcuries {[148,000 becquerels]}. We must compare these numbers to a whole body content of 3 microcuries, which if maintained, would be equal to the legal dose prescribed by the International Commission on Radiation Protection. Because of seasonnal dietary habits, the quite rapid excretion of Cs 137 by the human body and security factors inherent to the safety norms, it is very unlikely that these values will result into observable clinical casulties. For the time being we are maintaining an Emergency network which is taking air and precipitation samples amongst other things.

3.12 .....

Studies of Fallout ^{137}Cs in the Canadian North

Peter M. Bird, PhD, Ottawa, Ontario, Canada

CESIUM 137 (^{137}Cs) and strontium 90 (^{90}Sr) are generally considered to be the components of radioactive fallout which are of greatest public health interest insofar as the long-term health significance of fallout is concerned. By 1962, investigators[1-5] in Sweden, Norway, Finland, and Alaska were beginning to focus special attention on the problem of ^{137}Cs in northern populations.

In the North, many of the unusual features involved in the transfer of ^{137}Cs through the food chain into man are now known. In its simplest form, the food cycle involved initially a particularly effective trapping and retention of ^{137}Cs by lichens —a slow-growing ground cover with little root mass. This plant material serves as the principal source of nutrition for caribou and reindeer, at least during certain seasons of the year. Being chemically similar to the element potassium, the ^{137}Cs consumed is distributed throughout the flesh of the animal. Persons who use caribou or reindeer as a significant source of food therefore also consume ^{137}Cs at high concentrations and as a result accumulate in their own bodies relatively large amounts of ^{137}Cs.

In 1963, a special Canadian study was initiated to determine the ^{137}Cs levels in northern man and in important components of his food chain, and to assess their significance to public health.

Submitted for publication July 27, 1967; accepted Sept 15.

From the Radiation Protection Division, Department of National Health and Welfare, Ottawa.

Read before the Symposium on Circumpolar Health Related Problems, University of Alaska, College, Alaska, July 27, 1967.

Reprint requests to Radiation Protection Division, Department of National Health and Welfare, Brookfield Road, Ottawa 8 (Dr. Bird).

Background Data

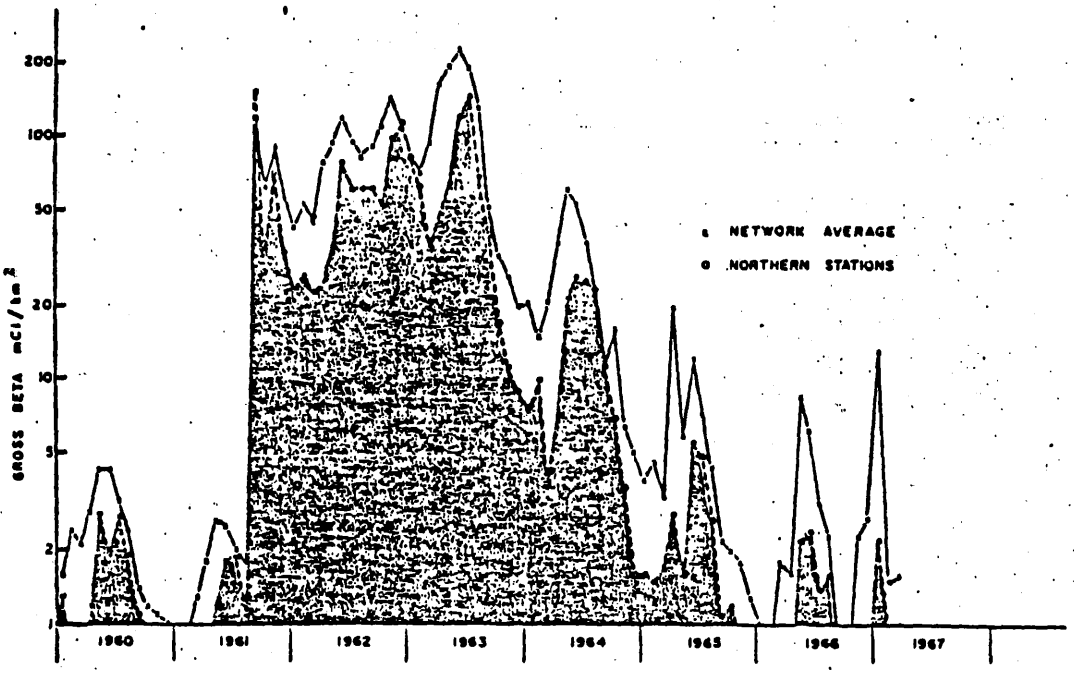
In 1959, as part of the Canadian nationwide fallout program, collection of precipitation and soil samples was initiated on a systematic basis. Sampling sites were selected principally from the populated areas of Canada but eight of 24 precipitation sampling stations were located in areas of low population density and six of these were in northern Canada. Similarly, four of 23 soil sampling sites were located in northern Canada.

Precipitation samples were collected continuously and the cumulative monthly collection was analyzed, initially for gross beta activity and, after 1963, also for ^{90}Sr and ^{137}Cs. While station-to-station differences in both gross beta activity and ^{137}Cs were recorded, some indication of the relative situation in the North can be obtained by examining time trends in the means for the small group of northern stations and the nationwide network as a whole. Figure 1 shows the variations in the monthly average gross beta activity deposited (in millicuries per square kilometer) for the whole network and for the northern stations. Data from Inuvik, Whitehorse, Yellowknife, Resolute, Fort Churchill, and Coral Harbour are included in the northern station averages. Figure 2 shows the monthly average ^{137}Cs deposited; these analyses were suspended at the end of 1965 because of the low values being observed. Despite significantly lower absolute values and a slower rate of change with time for the ^{137}Cs data, the general patterns in Fig 1 and 2 are similar and northern station data are consistently less than the nationwide average.

Soil samples were collected annually from nonagricultural, undisturbed sites and analyzed for ^{90}Sr. Northern sampling sites included Inuvik, Whitehorse, Yellowknife, and Fort Churchill. Of the 23 sampling sites throughout the country, Moosonee, Fort Churchill, and Inuvik soils were significantly higer in organic content, and year-to-year internal consistency for these three sites was generally poor. It is not clear whether this is due to the soil composition or to problems related to the sampling process. Figure 3 shows the average cumulative deposit of ^{90}Sr (in millicuries per square kilometer) for the whole network and for the northern stations. Results for Fort Churchill for 1964 and 1965 (21.6 and 135.5, respectively) were so incon... omitted from the ave... of the similarities in ... and the physical half... the differences shown ... reflect the relative de... two groups of stations.

The data shown in ... dent that there is n... that the deposition ... is in itself cause for ...

Fig 1.—Monthly average gross beta activity (in millicuries per square kilometer) deposited in precipitation for nationwide network and northern stations.



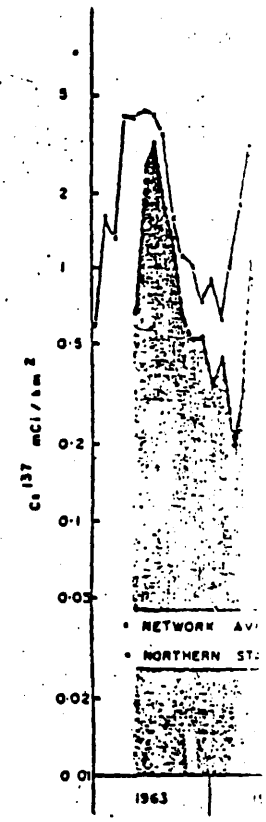


Fig 2.—Monthly ave... square kilometer) deposit... wide network and northe...

Recen...

In 1963, a supple... developed to determi... the unique food-chai... bou—man, to the heal... levels in the Canadia... was initially compose...

a. Urine sampling: ... the urinary concentra...

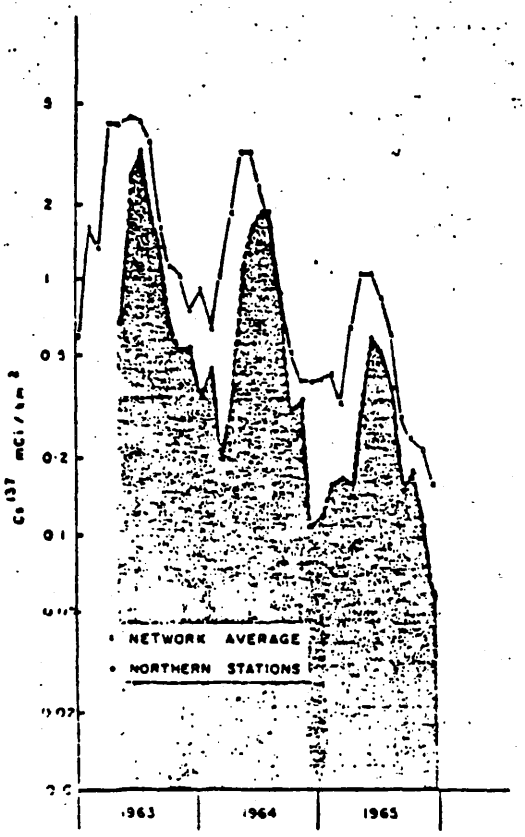


Fig 2.—Monthly average ^{137}Cs (in millicuries per square kilometer) desposited in precipitation for nationwide network and northern stations.

tively) were so inconsistent that they were omitted from the averaging process. Because of the similarities in the production process and the physical half-lives of ^{90}Sr and ^{137}Cs, the differences shown in the figure adequately reflect the relative deposition of ^{137}Cs for the two groups of stations.

The data shown in Fig 1 to 3 make it evident that there is no basis for concluding that the deposition of ^{137}Cs in the North is in itself cause for particular concern.

Recent Data

In 1963, a supplementary program was developed to determine the significance of the unique food-chain cycle, lichens—caribou—man, to the health assessment of fallout levels in the Canadian North. This program was initially composed of two main parts:

a. Urine sampling: It was assumed that the urinary concentration of ^{137}Cs could be used as an indicator of the amount of ^{137}Cs in the human body. Urine specimens were, therefore, collected from a number of individuals in about 25 northern communities.

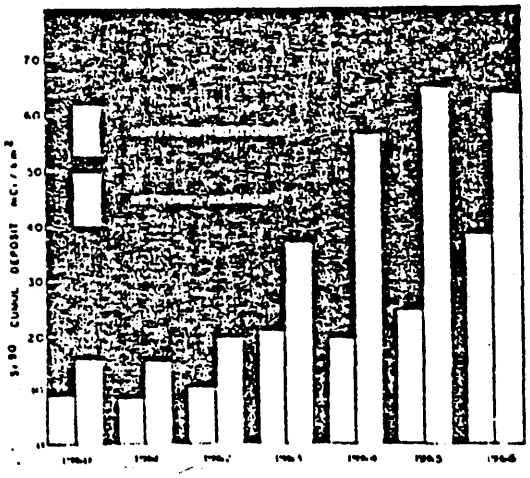
b. Meat sampling: The role of caribou or reindeer meat as the principal source of dietary contamination with ^{137}Cs was strongly indicated by the Alaskan and Scandinavian data. To confirm this situation in Canada, an initial sampling program was developed involving caribou, reindeer, and moose meat. Moose meat was soon shown[6] to contain relatively low concentrations of ^{137}Cs and sampling was then largely restricted to caribou and reindeer meat.

For urine, 24-hour specimens were preferred but if this was not possible the first morning collection was requested. The relative frequency of caribou or reindeer consumption was also recorded, according to the rather crude scale frequent, occasional, or rare. Despite inherent difficulties in arranging for the scientific collection of samples in such remote places where both transportation and communications are constant problems, the response to requests and instructions was remarkably good.

For meat sampling, the North was divided into areas which generally correspond to the limitations of the movement of caribou herds. Experience showed that to prevent sample deterioration it was necessary to dry the sample before shipment from the North.

Early results confirmed that the situation

Fig 3.—Average cumulative deposit of ^{90}S (in millicuries per square kilometer) in soil samples for nationwide network and northern stations.



was generally the same as that previously reported in Alaska and Scandinavia. Sampling, however, had been restricted to the mainland areas west of Hudson Bay and had been sporadic throughout the year. Because of the seasonal grazing habits of caribou and because of the relatively rapid biological turnover of ^{137}Cs, periodic sampling targets were established. At the same time coverage was extended to include Baffin Island.

Figure 4 is an outline map of the Canadian North showing the general boundaries of the meat sampling areas and the various communities where urine samples were obtained. For analysis of the data it has been more convenient to consider these areas in groups of two to form "western," "central," and "eastern" regions of the North.

Figure 5 is a histogram plot of the average ^{137}Cs concentrations observed in caribou meat in six-month intervals in the western, central, and eastern regions of the Canadian North. Bracketed numbers are the number

Fig 4.—Outline map of the Canadian North showing sampling locations and the boundaries of the six sampling areas.

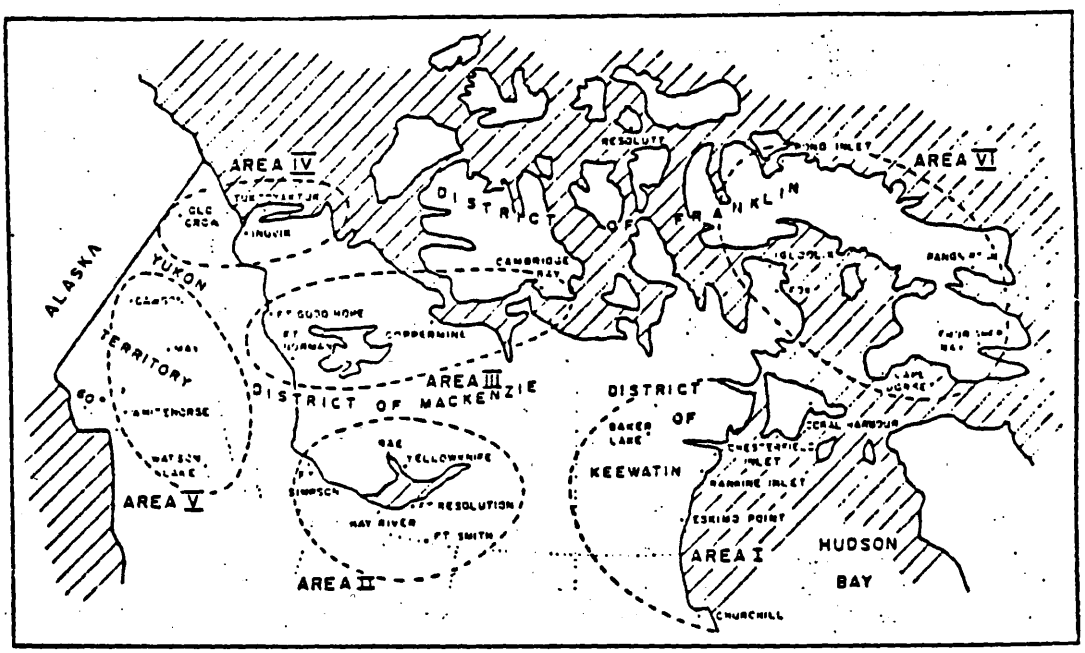
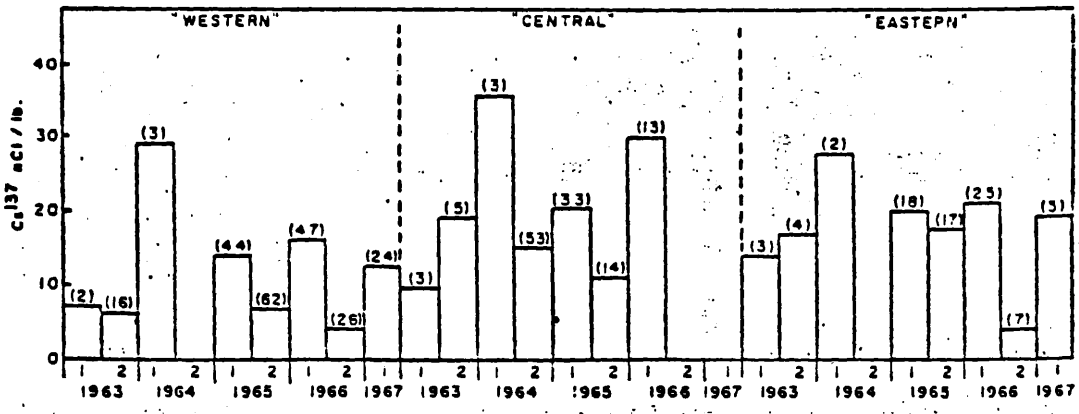


Fig 5.—Histogram plot of the average ^{137}Cs concentration (in nanocuries per pound of fresh tissue) in caribou meat in six-month time intervals, for the western, central, and eastern regions of the Canadian North.



of samples analyzed in each time interval. From 1964 onwards the average for the first half of the year is consistently higher than that for the second half. The results from the central and eastern regions are also higher than those from the western region. The averages plotted for 1967 represent a period of slightly less than six months.

Figure 6 is a similar histogram plot of the average urinary ^{137}Cs concentrations, in six-month intervals, for the three regions. Again, the bracketed numbers are those of samples analyzed. In this case, the seasonal pattern does not become suggestive until 1965, and again the data suggest that the concentration is highest in the eastern region. Evaluation of the urinary data is, however, complicated by the interrelationship of dietary and geographical factors. Figure 7 is a replot of the urinary concentration data according to diet type; class A includes the relatively frequent caribou consumers, class

Fig 6.—Histogram plot of the average ^{137}Cs concentration (in nanocuries per liter) in human urine in six-month time intervals, for the western, central, and eastern regions of the Canadian North.

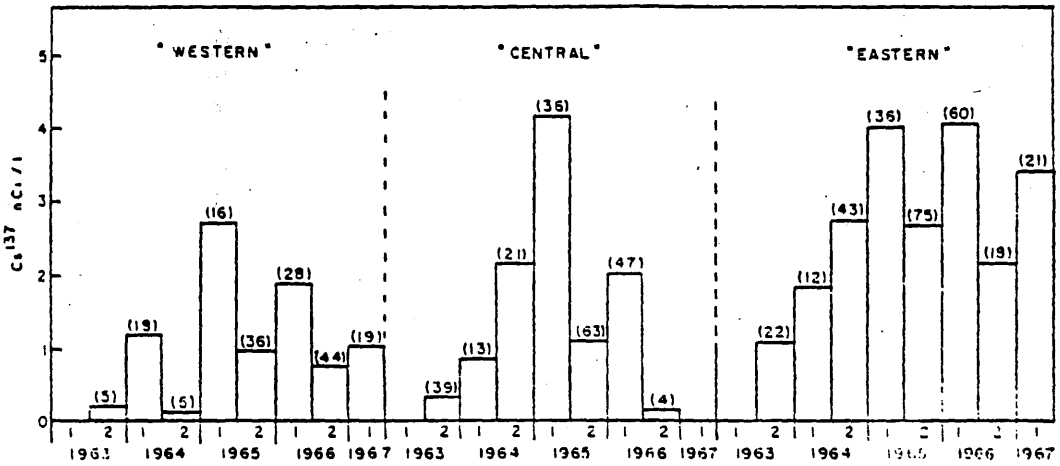
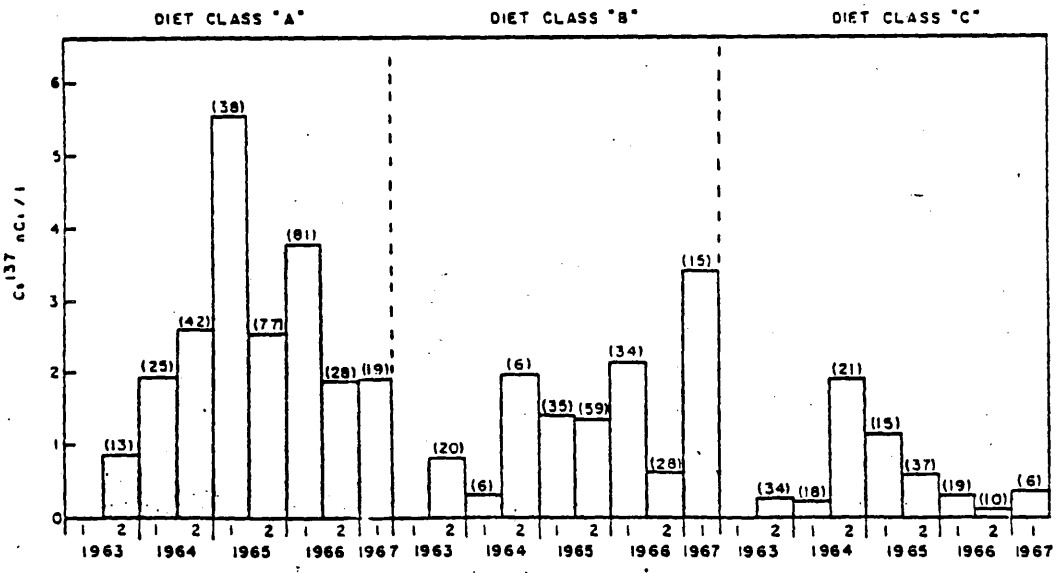


Fig 7.—Histogram plot of the average ^{137}Cs concentration (in nanocuries per liter) in human urine in six month time intervals for different diet classes.



B, the occasional caribou consumers, and class C, the rare caribou consumers. It is evident that higher urinary ^{137}Cs concentrations correlate quite well with increasing frequency of caribou consumption.

Although the urinary concentration data are primarily useful as an indicator of relative amounts of ^{137}Cs in the "average" body for different groups of people, it is possible to use such data to estimate actual amounts in the body.[7] Assuming that ^{137}Cs is eliminated from the body in proportion to the amount present and that the biological parameters tabulated by the International Commission on Radiological Protection (ICRP) apply, the highest single urinary concentration so far observed would theoretically correspond to a ^{137}Cs body burden about equal to that which can be derived from the ICRP recommendations as the maximum permissible sustained level for a small group of individuals. This would correspond to the dose limit[8] for individual members of the public, ie, one tenth of the occupational maximum permissible dose. There are, however, a number of uncertainties involved in a calculation of this type, particularly relating to the specific biological factors which apply to a given individual. Furthermore, ^{137}Cs is known to be eliminated fairly rapidly, so that downward trends in diet contamination levels would soon be reflected in lower body burdens and lower urine concentrations.

Thus, assessment of the urinary data emphasized the need for more information on the relationship between the urinary ^{137}Cs concentration and the body burden.

^{137}Cs Metabolism

The first opportunity to investigate more fully the relationship between urinary ^{137}Cs concentrations and body burdens involved two Eskimos from the Eastern Arctic. These subjects were found to have significantly higher ^{137}Cs body burdens and it was possible to carry out a sequential series of measurements of ^{137}Cs both in the body and in the urine. Both subjects claimed they had not eaten caribou for some months except for several meals while en route to Ottawa. Subsequent plotting of the urinary excretion data confirmed a recent short-term exposure to ^{137}Cs as shown by an early high-level elimination, followed by a lower rate.

Table 1.—^{137}Cs Whole-Body Counts (nCi) for Eastern Arctic Eskimos Measured in Ottawa, 1965

	Male			Female		
	Diet Class*			Diet Class*		
	A	B	C	A	B	C
Maximum	...	860	50	...	96	...
Minimum	...	26	12	...	27	...
Average	730	390	28	1,050	62	13
No. of subjects	1	5	4	1	2	1

* Diet class A, frequent consumption of caribou; class B, occasional consumption of caribou; and class C, rare consumption of caribou.

Table 2.—^{137}Cs Whole-Body Counts (nCi): Field Survey of Eastern Arctic Eskimos, Spring 1966

	Male			Female		
	Diet Class*			Diet Class*		
	A	B	C	A	B	C
Maximum	1,902	3,277	40	1,318	411	...
Minimum	378	24	23	804	52	...
Average	816	148	26	946	236	...
No. of subjects	98	89	37	28	10	0

* Diet class A, frequent consumption of caribou; class B, occasional consumption of caribou; and class C, rare consumption of caribou.

A second, more detailed study involved the controlled feeding to volunteers of caribou meat naturally labelled with ^{137}Cs. Although not yet fully completed, this study was designed to investigate the metabolism of ^{137}Cs with special reference to its absorption into the body, to its daily excretion in urine, and to the effect of diet on its excretion. To date two subjects have been studied and the results[9] indicate that absorption of ^{137}Cs was almost complete and that there is considerable recirculation between the gut and the body. Daily variations in urinary ^{137}Cs continued even at elevated body burdens and this suggests that the normal daily variations previously observed were probably not primarily attributable to differences in dietary ^{137}Cs.

Whole-Body Counting for ^{137}Cs

A whole-body counter suitable for determining ^{137}Cs body burdens became operational in 1965. This facility consists of four large-volume plastic scintillators mounted two above and two below a supine subject. The outputs of the phototubes are fed to a multichannel pulse height analyzer. The detector system is housed in a heavily shielded

(eight-inch thick) steel enclosure to reduce background radiation effects. Such a system is ideally suited to the rapid measurement of small amounts of radioactivity in human beings.[10]

During 1965 whole-body counter measurements were carried out on 14 Eskimos from the Canadian Eastern Arctic. The results are shown in Table 1; the average for the non-caribou consumers was consistent with the average found for Ottawa residents.

Because the movement of healthy Eskimos into the Ottawa area was limited, work was also initiated on the construction of a portable unshielded whole-body counter. Using the work of Palmer[11] as a guide, a 3 × 3-inch integral line NaI(Tl)-activated crystal and photomultiplier was assembled in a thermal packing. The output signals were analyzed in a basic 1,000-channel pulse height analyzer provided with a four-channel read-out and calibrated for the ^{137}Cs and potassium 40 (^{40}K) photopeaks. The system was powered by a rechargeable battery pack permitting at least eight hours of usable operation on a single charge.

Following initial trials in the Ottawa laboratory, a field survey was conducted in the Eastern Arctic in the Spring of 1966. Care was taken to minimize thermal and mechanical shock and no equipment difficulties were experienced. A total of nine communities was visited and measurements were made on some 260 Eskimos. A summary of the results is given in Table 2. Again the significance of the relative frequency of caribou consumption is evident. Only one value, and that for a reported occasional caribou consumer, exceeded the sustained body burden which would result in a dose equal to the dose limit for individuals in the population. The average ^{137}Cs body burden, even for the frequent caribou consumers, was well within this limit.

Table 3.—*Preliminary ^{137}Cs Whole-Body Counts (nCi): Field Survey of Central and Western Arctic Eskimos Spring 1967*

	Men		Women	
	Baker Lake	Reindeer Station	Baker Lake	Reindeer Station
Maximum	3,337	579	2,064	408
Minimum	469	150	277	112
Average	1,577	317	1,074	215
No. of subjects	51	10	63	8

	Male School children		Female School children	
	Baker Lake	Reindeer Station	Baker Lake	Reindeer Station
Maximum	735	278	1,017	220
Minimum	80	61	54	64
Average	251	148	375	121
No. of subjects	41	4	66	8

Table 4.—*Average ^{137}Cs Concentrations in Various Reindeer Organs**

Organ	^{137}Cs (nCi/lb fresh tissue)
Heart	10.0
Liver	5.8
Lung	10.8
Kidney	12.1
Testes	9.9
Spleen	8.7
ntler	4.4
Bone	2.2
Meat and muscle	13.2
Second stomach and contents	4.4

* In four animals killed May 10, 1967.

A second field survey, in the Central and Western Arctic, was undertaken in 1967. So far, only preliminary whole-body counting results from Baker Lake and Reindeer Station (near Inuvik) are available. These are shown in Table 3. Data on one female subject from Baker Lake was omitted from this summary pending further checking. The fact that female schoolchildren in Baker Lake show a higher average body burden than the male schoolchildren may be attributable to the fact that on the average they were older and heavier than the males.

Special Investigations

Inuvik was selected as the headquarters base for the 1967 field studies as space and facilities were made available at the Inuvik Research Laboratory. Plans included the collection and analysis of a variety of additional samples as part of a broader mechanism study. Only preliminary results are available at this time. Table 4 shows the results of ^{137}Cs measurements on various reindeer organs collected in the Parsons Lake district, about 30 miles northeast of Reindeer Station.

Summary and Conclusions

A special study of fallout ^{137}Cs in the Canadian North has shown (1) that relatively

high concentrations do occur in caribou and reindeer and that there is probably a geographical and a seasonal pattern in these levels; (2) that levels in humans are highest in those who consume caribou meat frequently and that average levels in humans so far observed correspond to radiation doses well within the dose limit recommended for individual members of the population; (3) that selected population groups (eg, caribou eaters) can be much more significantly exposed than the average for the rest of the population; (4) that there is a need for further studies of the relationship between urinary ^{137}Cs concentrations and body burdens to permit a more useful interpretation of the urinary ^{137}Cs surveillance data; and (5) that the situation warrants continuing study for two reasons: (a) there is, as yet, no clearly established downward trend in levels despite the absence of significant atmospheric weapons testing for several years, and (b) the relatively high ^{137}Cs levels which have been observed provide an excellent opportunity for carrying out investigations of the movement of this fission product through the food chain into man; such information could be of considerable importance in the event of a large-scale resumption of atmospheric weapons testing.

Members of the Medical Services Branch, Department of National Health and Welfare, and of the Department of Northern Affairs and National Resources assisted in conducting these studies.

Design and development of major components of the portable whole-body counter was carried out by officers of Atomic Energy of Canada, Ltd. (Commercial Products) and the Defence Biological, Chemical and Radiation Laboratories, Defence Research Board. The analytical measurements were carried out by scientists and technicians of the Radiation Protection Division. Mr. D. W. Lecuyer took the portable whole-body counter into remote northern communities as part of the field work and prepared the illustrations for this article.

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11. Palmer, H.E.: Simplified Whole Body Counting, *Health Phys* 12:95 (Jan) 1966.

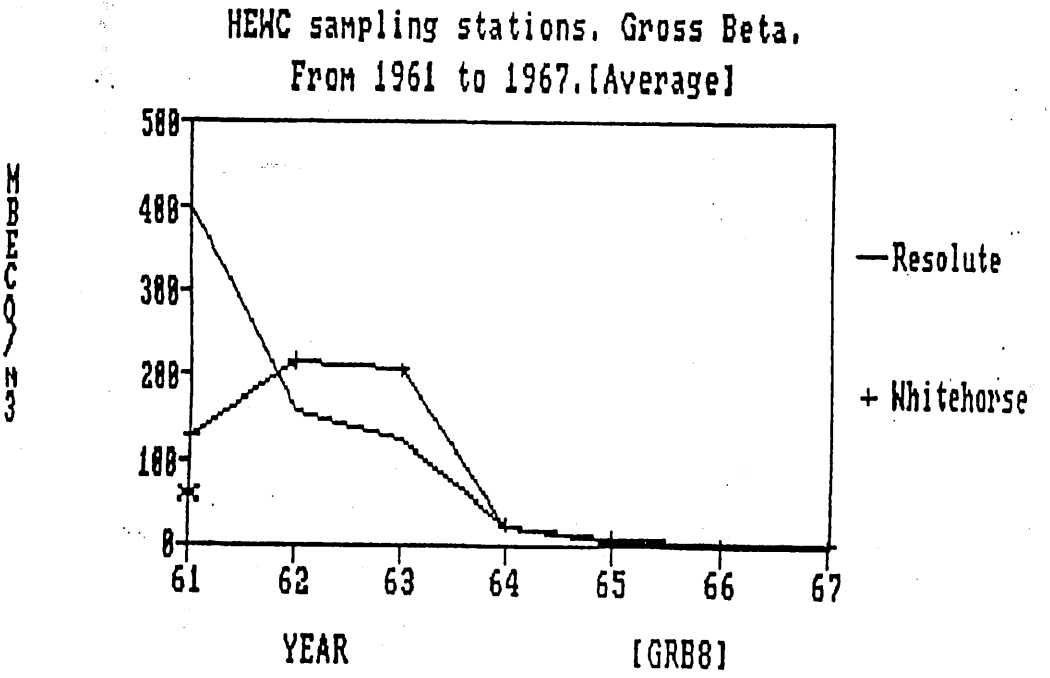
ENVIRONMENTAL INFLUENCE ON INTELLIGENCE

. . . The United States Children's Bureau reports that only 9% of children placed by public agencies and only 22% of children placed by private agencies were adopted at under one month of age, while 70% of children placed independently were less than a month old. According to Dr. Harold Skeels of the National Institute of Health, the frequency of defective children who were placed independently, at a much younger age, is no greater than in agency placement. In any case, such studies as have been made of the relation of intelligence between children and their adoptive parents indicate that the children tend to approximate the intelligence of the adoptive parents rather than that of their natural parents. Thus, the evidence seems to indicate that intelligence is strongly subject to environmental influence.—Isaac, R.J.: Children Who Need Adoption: A Radical View, *The Atlantic Monthly* 212:45-50 (Nov) 1963.

To Inuit Readers and the Ministers of Health and Welfare
(Canada and NWT)

Fallout in the Canadian Arctic.
A health Hazard?

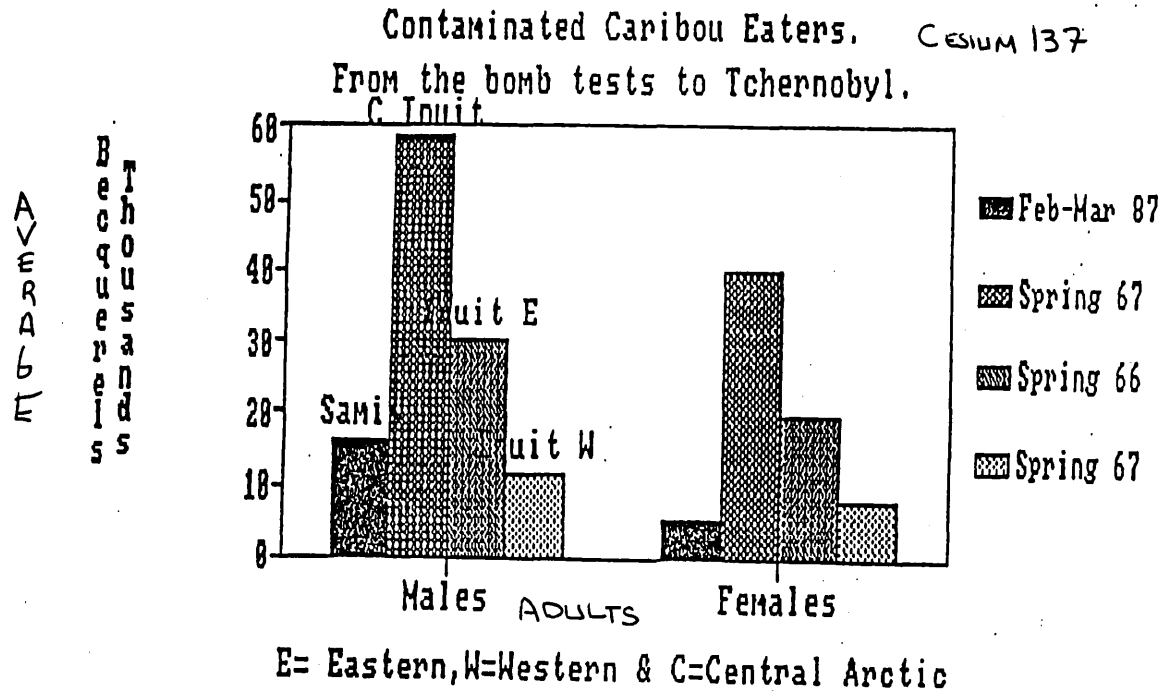
In 1961 the U.S.S.R. exploded the equivalent of 6100 Hyroshima bombs in the atmosphere (122 Megatons). Their main testing site was on the island of Novaya Zemblya (74 degrees north) about 4000 kilometers North East from Iqaluit. Massive fallout clouds were detected around the world because of these tests. The Canadian Arctic received an important amount of fallout not only from the tests of 61, but from most of the atmospheric tests done from the early 50's till the final Chinese atmospheric test of October 1980.



The left hand term MBECQ/M3 means millibecquerel per cubic meter of air. Gross Beta is simply the measuring of all beta emitters (a form of radioactive decay). The natural gross beta value is close to zero.

As you have noted, 1961 was a very bad year for radioactive fallout. Perhaps the worst year on record for the Canadian Arctic.

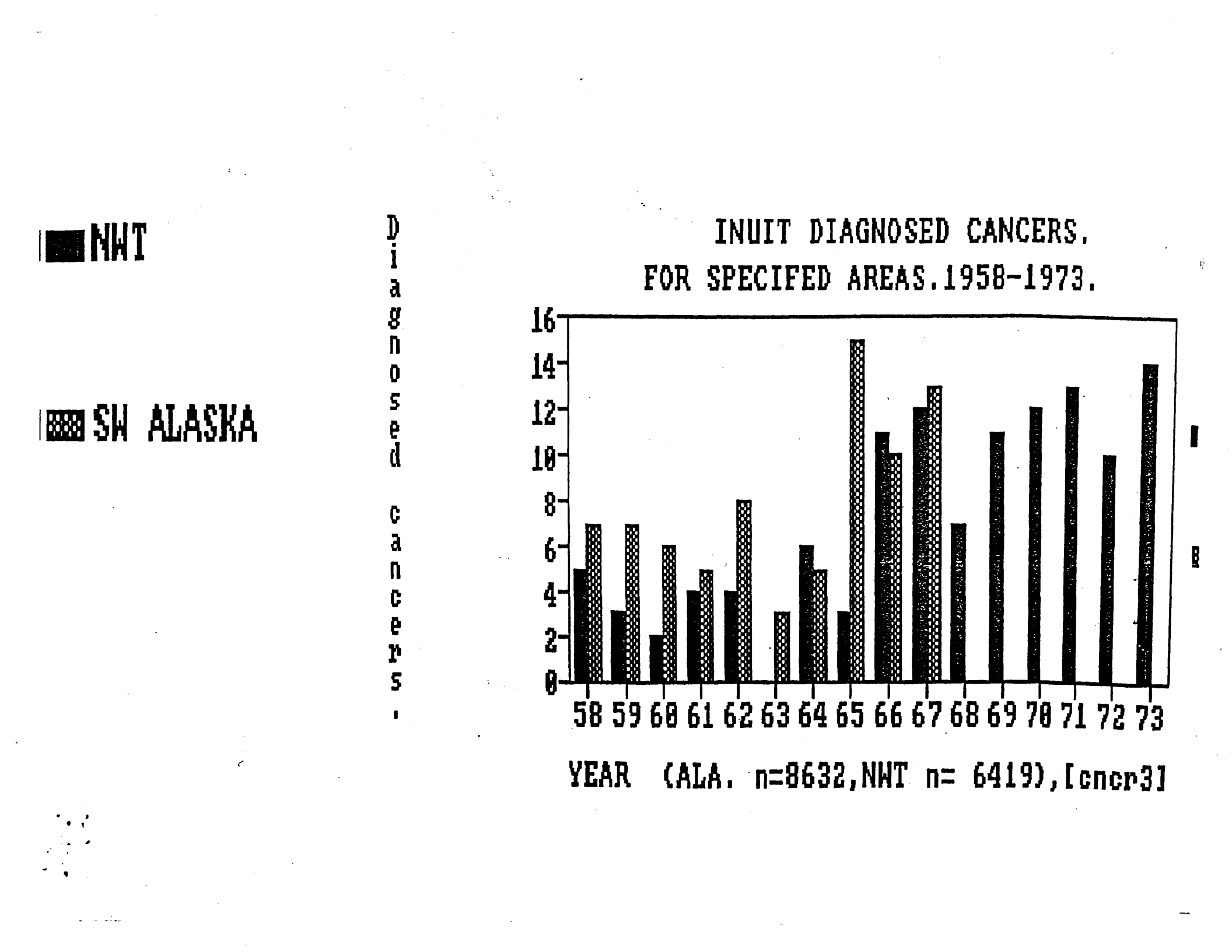
Radioactive dust from fallout deposited itself either by gravity or precipitation everywhere. Inuit are at the end of the Arctic food chain. In the North lichens have absorbed a lot of this fallout. From 1963 to 1967 Caribou and Inuit were measured to see how much radiation they have absorbed. I do not know of one Inuk who has been told about this then. They have asked many Inuit to lay down in what is called a whole body counter. It is a device which measures one type of radiation at the time. The scientists have found Inuit with a lot of radiation in them. An average close to 60,000 becquerels (one nuclear disintegration per second is one becquerel) of cesium 137 was found in the adult males of the community of Baker Lake in the spring of 67. This number is comparable to old Samis of Sweden who refuse to change their diets after the Tchernobyl fallout contaminated their land in May of 86. In the 1960's the Inuit of the Central Arctic depended on land locked fish and Caribou, Eastern Arctic Inuit had a more mixed diet, the Western Arctic Caribou was less contaminated.



Because of the Tchernobyl Nuclear reactor accident, the Sami people (laplanders) of Sweden have been warned on several occasions that their Reindeer was contaminated. Most Samis have decided to change their diets accordingly. Also bentonite treatment of reindeer reduces the amount of Cesium 137 to values as low as 30 becquerels per kilogram.

Other Scientists in other countries were measuring their respective caribou or reindeer peoples. In Sweden, Finland and Norway the Sami (Once called Laplanders) were found to have as contaminated caribou as in Northern Canada. This is also true for Alaskan and Russian Inuit. They went along and measured contaminated native people as a matter of interest. Some scientists didn't know if the levels of radiation were too high or dangerous. They depended on, and still are depending on a group of scientists who decide on safe limits of radiation in food. This group is called the ICRP. The International Commission on Radiation Protection. These scientists are mainly nuclear physicists (people who design nuclear reactors or atomic bombs, specialists in nuclear physics). They are hardly the right kind of people to decide on the toxicity of radioactive substances on human beings. Their commission does not consist of a lot of medical doctors.

Was the caribou in the sixties safe to eat? That is a question that must be answered soon. Look at the next graph. This display shows how many Inuit were diagnosed with cancer from 1958 to 1973. The NWT Inuit consisted of Western and Central Arctic Inuit. The Alaska Inuit were the Yupik Inuit found in the southwestern part of the state.....


NWT
SW ALASKA
Diagnosed cancers.
INUIT DIAGNOSED CANCERS.
FOR SPECIFED AREAS.1958-1973.
16
14
12
10
8
6
4
2
0
58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73
YEAR (ALA. n=8632,NWT n= 6419),[cncr3]

A sharp increase in the incidence of cancers occurred at about the same time for the Inuit of the Southwest of Alaska as well as for the Inuit of the Central and Western Arctic. This despite different periods of assimilation into the modern world for each region. Lung cancer was much more prominent in the Central Arctic (from 1967 to 1980) even though cigarettes were introduced in the Western Arctic earlier (before 1955). However, Inuit were far more radioactive in the Central Arctic....

The Central and Western Arctic of 1966-67 had as much cases of diagnosed cancers as from 1958 to 1965. In the same regions 49 Inuit were diagnosed with cancer from 1950 to 1965 while from 1966 to 1973 there was 90 cases. All the numbers have been verified with a satisfactory degree of confidence according to the doctors who have compiled these statistics.

The main effect of eating low doses of additional radiation is basically a reduction in the effectiveness of ones immune system to "fight off" infections or destroy tumors.

These facts (and several others) deserve a full investigation done by a panel of medical doctors independent from Radiation Protection "experts", who are already convinced that the fallout radiation absorbed by Inuit was very safe, despite facts pointing to the opposite conclusion. Objectivity is the key factor in any inquiry.

As fallout radiation from Tchernobyl and the bomb tests are to be found in significant amounts throughout today's Canadian Arctic. Canadian safe limits for radioactive substances in food must be found. According to well known scientists, ICRP present limits are up to 5 times too high. This means that a safe limit for cesium 137 in caribou meat should be 60 becquerels per kilogram. Iqaluit region caribou averaged at 360 becquerels per kilogram in December of 86.....

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