



T-1628-78

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IN THE FEDERAL COURT OF CANADA
(TRIAL DIVISION)

BETWEEN:

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THE HAMLET OF BAKER LAKE, et al
Plaintiffs

-and-

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THE MINISTER OF INDIAN AFFAIRS
AND NORTHERN DEVELOPMENT, et al
Defendants

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Held before The Honourable Mr. Justice
P. M. Mahoney, at 330 University Avenue,
8th Floor, Toronto, Ontario,
June 4th - 8th, 1979, inclusive.

* * *

APPEARANCES:

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A.E. Golden, Esq.,
D. Estrin, Esq., for the Plaintiffs.

L.P. Chambers, Esq.,
D.T. Sgayias, Esq., for the Minister of
Indian Affairs and
Northern Development.

Ms. Price, for Essex Minerals
Company Ltd.

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W.C. Graham, Q.C., Esq.,
R.W. Cosman, Esq., for Pan Ocean Oil
Limited, Cominco Ltd.,
and Western Mines Ltd.

T.G. Heintzman, Esq.,
Ms. Marvyn K. Koenigsberg, for Urangesellschaft
Canada Ltd. and
Noranda Exploration
Co. Ltd.

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VOLUME XV

Thursday, June 7th, 1979.

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---Upon resuming at 9:30 a.m., June 7th, 1979

MR. CHAMBERS: My Lord, I call, as my next witness, Dr. Calef.

GEORGE WALLER CALEF, YELLOWKNIFE, NORTHWEST TERRITORIES
SWORN

THE REGISTRAR: Would you state your name, your complete address and your occupation?

THE WITNESS: George Waller Calef; 572 Northland, Yellowknife, Northwest Territories; I am a Wildlife Biologist with the Northwest Territories government Wildlife Service.

EXAMINATION IN CHIEF

BY MR. CHAMBERS:

Q. Dr. Calef, I am showing

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MR. GOLDEN: I'm sorry. If

I may, before.

My Lord, this witness is obviously called to give expert evidence, and as a courtesy to him, since expert witnesses tend to delve in narrative rather quickly, I thought at this point it useful to make my objection to him being called.

I am aware of the right to the Defendant to call what is referred to in Rule 482 as rebuttal evidence of experts. It is my submission that right is strictly limited to matters raised in the evidence -- whether expert or otherwise, I suppose -- of the Plaintiffs, raised by the Plaintiffs.

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2316.

G. Calef, ex in chf
(Chambers)

I have no specific knowledge of what Dr. Calef will testify to, but I thought it useful at this point, rather than waiting until I have to get up in a middle of an answer -- or, rather, question -- to detail my objection, so Your Lordship may consider it and we can learn, at least, to what specific point Dr. Calef is being called. Then we will know whether or not the witness and Mr. Chambers is addressing himself to that point.

I would emphasize at this stage that it is also my submission that counsel may not in cross-examination of the Plaintiffs' witness set up an issue which he would then call evidence to rebut: that is the rebuttal directed towards issues rather than the artificiality -- which I think we all sometimes are guilty of -- of trying to create an issue.

In view of the wording of the rule, I think it is only fair to assume that that rule is intended to prevent new issues being created so that they then become the proper subject of rebuttal. In other words, you do not have a key that you produce and use yourself in order to call evidence outside the rule.

I do not suggest that is what happened here, but I am anxious, because of the presence in this case of what I would loosely

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refer to as the conservation issue, which is not one that we raised at all, and, as you know, is one which I have taken some objection to. That was developed in a minor way -- I don't think in a serious way in cross-examination. I would not want that to become a key to this evidence being called.

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I am aware that Dr. Calef's paper was referred to by Dr. Geist in his evidence. He touched on it. He said more work had to be done in this area. There is some direction there. I do not know what rebuttal might arise from that. I think my friend is quite free to deal with that kind of matter, assuming it is proper rebuttal.

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I suppose at this stage, My Lord, it is a plea for strictness of interpretation.

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THE COURT: Okay.

MR. CHAMBERS: My Lord,

I have handed copies of this to my learned friends.

BY MR. CHAMBERS:

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Q. Dr. Calef, I will just review with you your education and your experience.

First of all, you were born on March 1, 1944, at Los Angeles, California.

A. Yes, I was.

Q. You are a Canadian

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citizen?

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2318.

G. Calef, ex in chf
(Chambers)

A. Yes.

Q. You got your university education as follows: 1960-64, University of Chicago, Bachelor of Science in Zoology?

A. That is true.

Q. 1966-67 you did graduate studies in Zoology, University of Chicago?

A. Yes.

Q. Between 1967-71 you attended the University of British Columbia and obtained a Ph.D. in Zoology?

A. That's right.

Q. You are also in receipt of certain fellowships and honors. Among them are the National Science Foundation undergraduate research fellowship 1964; National Science Foundation summer research fellowship 1964; Birdhaven Memorial Scholarship, University of Chicago; President, Maroon Key Society, University of Chicago, 1964; Order of the C, University of Chicago; Order of the Iron Mask, University of Chicago.

Were some of those fellowships and honors bestowed on you as a result of your domestic achievements?

A. Yes, they were.

Q. In 1964 you were engaged in some research for the National Science

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Foundation at the Marine Biological Laboratory,
Woods Hole, Massachusetts?

A. Yes.

Q. In 1965 to 1966 you were
research assistant, Woods Hole Oceanographic
Institution, Woods Hole, Massachusetts?

A. Yes.

Q. 1971-74 you were a
Biologist-Photographer, working for Inter-
Disciplinary Systems Ltd., Winnipeg, Manitoba?

A. Yes.

Q. Does this concern what
is sometimes referred to as IDS?

A. Yes, it is.

Q. And while so engaged
you were doing field research on Porcupine caribou?

A. Correct.

Q. And you worked on the
impact assessment of Mackenzie Valley gas
pipeline ?

A. Yes, I did.

Q. Between 1974 and 1975
you were a resource person for the Canadian Artic
Resources Committee, Ottawa, Ontario. Would you
explain what this work entailed?

A. Yes. The Canadian
Artic Resources Committee paid my salary to be
a resource person and assistant to the Committee

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for Original Peoples entitlement, which is a native-peoples group in the Mackenzie Delta and I was to advise them and to assist them on environmental matters, particularly at that time the hearing for the Mackenzie Valley Pipeline was coming up and I helped them with their preparation for that hearing.

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Q. 1975 to 1976 you were a Wildlife Biologist, Fish and Wildlife Service of the Government of Northwest Territories, Fort Smith, Northwest Territories, is that correct?

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A. That's right.

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Q. And then you conducted aerial surveys of woodland caribou on Horn River Plateau and also aerial surveys of barren-ground caribou on winter ranges near Coppermine?

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A. That's right.

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Q. 1976-1977 you were a Wildlife Biologist, again with Fish and Wildlife Service, Government of the Northwest Territories, Yellowknife, Northwest Territories?

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A. Yes.

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Q. Leader of Artic Pipeline Project Terrestrial Wildlife Studies; Supervisor of research on wolf-bison interactions on Slave River Lowlands; research on birds and mammals in the Northeastern Keewatin?

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A. Yes.

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2321.

G. Calef, ex in chf
(Chambers)

Q. In 1977 to 1978 you were a Wildlife Biologist, employed by the Wildlife Service, Government of the Northwest Territories, Yellowknife, is that so?

A. Yes.

Q. What is the difference between the Wildlife Service of the Government of the Northwest Territories and the Fish and Wildlife Service of the same government?

A. Well, someone decided that we did not have the responsibilities for the fisheries resourch. Sometime between 1977 and 1978 that decision was made, so the name was changed appropriately.

Q. I see. In this period 1977 to 1978 you were the leader of caribou research for the service, and you designed a research and management program for Northwest Territories caribou; is that correct?

A. Yes, it is.

Q. And you also carried out research on wolves and caribou of the Bathurst Herd?

A. Yes. That work has also continued to the present time. That is still my position and still my responsibility.

MR. CHAMBERS: My Lord, I submit that Dr. Calef has been identified as

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an expert in the field of caribou research, and
I tender his Curriculum Vitae as an exhibit.

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EXHIBIT NO. D-12: Curriculum
Vitae of Dr. G.W. Calef.

BY MR. CHAMBERS:

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Q. Dr. Calef, can you
describe to the court the mode of your work while
engaged in caribou research; what particularly
I would like to know is how you go about doing
your work?

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A. Most of the work that

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I have carried out on caribou has been in
population estimation, population ecology;
which consists of doing surveys in the field
that are designed to determine the numbers,
composition, productivity of herds, their
distribution throughout the year, their migration
patterns, and any other environmental or
behavioural factors which may affect the
population dynamics of the caribou herds.

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Q. And how do you go

about it? Did you do this on foot, by aerial
surveys, or by what means?

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A. Well, obviously, when

you are working in the north where there are
no roads, your major means of transportation
is by aircraft. Aircraft are used extensively
for survey work. However, I have travelled by just

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about every means of transportation in the Arctic
at one point or another in the course of my work.

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We certainly do make
observations from the ground in close proximity
to caribou of sex and age structure of the
caribou, their behaviour and so on.

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Q. Have you been engaged
in tagging operations?

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A. Yes, I have. On two
occasions I have participated in tagging caribou
at water crossings on the Porcupine River. These
are caribou from the Porcupine Herd. We did
both ear tagging and what is called neck collaring,
which consists of attaching about a three or four
inch wide plastic or fiberglass colored collar
around the neck of the caribou.

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Q. What is the purpose
of tagging animals in that way?

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A. Well, in this particular
case we were interested in determining the ranges
over which animals that were crossing the Porcupine
River at certain places dispersed, and with a
long-term view of determining how consistent
animals were in their use of certain winter ranges,
certain summer ranges and so on. There can be
other purposes to tagging; for example, I am
encouraging the Northwest Territories Wildlife
Service at the moment to try to do neck collaring

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2324.

G. Calef, ex in chf
(Chambers)

on a relatively routine basis on most of the major herds as an attempt to be able to detect exchanges with herds or movements from caribou from one herd to ranges where they are not expected to occur.

This is, in my opinion, the only way that you can detect movements of caribou from one range to another. This is the only unequivocal way.

Q. Dr. Calef, have you been involved in any way in studying the Kaminuriak Herd or in evaluating data pertaining to it?

A. Yes, I have. When I was leader of the Artic Island Pipeline Project, part of the area that proposed pipeline would have passed through was Kaminuriak Herd range. I did a small amount of work in the field there myself, and some of my assistants and fellow biologists conducted surveys and various observations on that herd over a two-year period and, of course, as part of my responsibility as the Leader of Caribou Studies for the Northwest Territories, I have to evaluate and advise on research and monitoring of that herd.

Q. Have you been able to formulate an opinion about the present state or the recent state of the caribou herd the Kaminuriak Herd?

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2325.

G. Calef, ex in chf
(Chambers)

MR. GOLDEN: I have already made my objection, My Lord. This is simply corroborative of Mr. Miller's evidence. I assume it is.

It may be different. Whatever it is, it is on that subject matter.

THE COURT: I will reserve on the objection. I really have to go through the length of the trial to see how certain evidence did come in.

We will have to hear the answer and see whether it is proper rebuttal. I cannot pretend total recall at this stage as to where particular facts came in.

MR. GRAHAM: My Lord, without wanting to prolong this because I appreciate what you are doing, but when you are considering that point, My Lord, you might want to bear in mind that the pleadings, at least in our view, do specifically raise this issue. My friend says this is not an issue raised in the pleadings.

If Your Lordship looks at paragraph 25 of my friend's pleadings he does say, "Damage to the Plaintiffs by reason of the consequential substantial reduction of wildlife harvest available to them ..." referring to mineral activities. In consequence of mineral activities.

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Then, in our Statement of Defence, we specifically said that it is outside our control -- what has been happening. And when they were asking on discovery, "What do you mean by that?" we said, "Over-killing and over-hunting is one of the things that is outside our control."

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So I would say that on the pleadings the issue is raised right there.

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And my friend puts the question to his own expert, having asked various Inuit, "Why are the caribou not there anymore?" The Plaintiffs all give evidence that they are not there because of the mining companies.

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He then put it to his expert, "Is the absence of the caribou consistent with the explanation given by the Plaintiffs?" And his experts say, "Yes, it would be consistent with that."

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It is in the pleadings. It has been raised in direct examination by the Plaintiff's expert and their own evidence. I do not see how it can now be said that it is not an issue in this trial.

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MR. GOLDEN: That is not what I am saying, My Lord.

What I am saying is that it is not rebuttal evidence. It is evidence

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that does not come from the evidence of Dr. Geist. It is not an answer to Dr. Geist's evidence.

My friend has put in an Affidavit from Mr. Miller, in proper form, in which Mr. Miller dealt with both issues: what we call the conservation issue, being more polite than the words over-kill; and the other issue which is the harm or lack of harm of mining activities to the caribou, which goes from everything from diverting them to distressing them -- over-stressing them and so on.

Quite clearly, the only area of rebuttal would be some area injected by Dr. Geist. And Dr. Geist did not deal with the conservation issue and my friends are not at liberty -- it has nothing to do with whether it is relevant. Your Lordship has already ruled that His Lordship is going to admit it on the basis of presumed relevancy. I objected to that the other day. But, this question is somewhat different. The rule that we have been forced to be constrained to, Rule 482, requires that that evidence be in rebuttal to the evidence of one of our witnesses. And this is not proper rebuttal evidence.

THE COURT: I will simply have to take it under advisement. When I see the

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transcript I will see how it goes.

MR. GOLDEN: Yes, My Lord.

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I'm quite confident about Your Lordship's ability to disregard the evidence. The fact is that it comes in, presumably, in corroboration of evidence that has already been properly given.

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I do not think that the rule anticipates corroborative evidence being slipped in under the guise of rebuttal. I do not know what Your Lordship would do with that in assessing the facts in the case.

MR. CHAMBERS: Well, My

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Lord, in my respectful submission, if I may state it for the record --

THE COURT: Surely.

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MR. CHAMBERS: The Plaintiffs have raised the broad issue of the unavailability to the Plaintiffs of caribou meat. They raised two subsidiary issues. The first, there has been no reduction in the size of the Kaminuriak Herd. We have heard evidence to this issue from native hunters, My Lord -- there has never been a reduction in the number of caribou. The second one is the second subsidiary issue under mining exploration activities as a result of the issuance of permits by the government have driven all these caribou away from the Baker Lake area.

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My Lord, that I am entitled to lead rebuttal evidence -- by as many witnesses that may please the court -- to show that this is in fact not so: that (a) there has been a reduction in the number, and (b) there has really been no large scale displacement of the herd other than due to the reduction of the herd. This has been the thrust of the testimony yesterday. And the next group of questions I am going to ask Dr. Calef will be directed toward the same issue.

I respectfully submit it is proper rebuttal evidence. I do not need an Affidavit for this. The rules specifically provide that rebutting evidence does not require to be --

THE COURT: I have your position, too.

I should say that I think Mr. Estrin made a valid point yesterday, and I must say I was not terribly on top of the thing at that time, indicating that the first point that you raised, namely, the reduction of the herd, perhaps has not been raised -- the displacement, if you like. They are not there in Baker Lake.

Mr. Estrin pointed out that that was not necessarily predicated on the reduction of population; that they had been

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2330.

G. Calef, ex in chf
(Chambers)

chased away by certain activities. I have this now in mind, and all I can do is review the transcript when we have it.

I have everybody's point of view on this.

MR. CHAMBERS: I can only say, finally, in this regard, that, of course, this broad allegation of unavailability of caribou meat due to mining activities and so on has been denied in our pleadings.

THE COURT: The Kaminuriak are not the only herd.

MR. CHAMBERS: That is true. This witness will also have some light to shed on the Beverly Herd, which Your Lordship has heard very little about until now.

MR. GOLDEN: Again, I hope that is properly rebuttal. I know Your Lordship is inclined to allow the evidence in but I do not want my friend to misinterpret that as some kind of licence just to wander all over the lot.

THE COURT: We will see.

MR. GOLDEN: We have had no evidence so far on the Beverly Herd that I am aware of, the population or anything else.

MR. CHAMBERS: That's right.

THE COURT: I have indicated what I am going to do. I don't know how long you

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2331.

G. Calef, ex in chf
(Chambers)

chaps want to talk about it.

MR. GOLDEN: We keep getting more material on it.

MR. CHAMBERS: I just wish to state, with all due deference to my learned friend, Mr. Golden, there has been extensive testimony at Baker Lake about hunting at the Schultz and Beverly Lake areas and disappearance of caribou from there, My Lord, goes to the same question as in connection with the Kaminuriak Herd and, therefore, I am entitled to lead rebuttal evidence about this matter.

BY MR. CHAMBERS:

Q. Dr. Calef, have you been able to formulate an opinion about the state of the -- the recent state of the Kaminuriak Herd?

A. I assume you mean population size and distribution of the herd?

Q. Yes.

A. Yes. My opinion is that the evidence indicates that the Kaminuriak Herd has been declining since at least 1968 and almost certainly since 1950, and that concomitant with this decline in population there has been a reduction in the overall amount of range used by the herd and particularly the southern boundary of the winter range has

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been moving gradually farther and farther north to the extent that in, say, the last five years, the penetration of the caribou into the forests of Manitoba has been the exception rather than the rule; whereas it used to be the rule as it is in most of the other Central Artic barren-ground caribou herds in Canada.

Q. Dr. Calef, we have heard considerable evidence at Baker Lake from the Plaintiffs to the effect that there are not as many caribou around the Kazan River or Kazan Falls area as there used to be in the past. Would this surprise you?

A. No.

Q. Why not?

A. The reason it would not is because -- it is my understanding from the work of Canadian Wildlife Service Biologists that the Kazan River would be considered to be the periphery of the herd's range, as it was, say, in 1968 and the current theory of caribou populations is that as populations decline or expand, the range declines and expands relatively proportionately so, if the herd had decreased in size, one would anticipate that there would be a withdrawal of the animals from the peripheral parts of the ranges.

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2333.

G. Calef, ex in chf
(Chambers)

Maybe I should say it
the other way around: not a withdrawal but
just that they would not find it necessary to
go through the peripheral parts of the ranges.

Q. Exhibit D-10 is
the document entitled "The Decline of The
Kaminuriak Caribou Herd -- May, 1979,"
and Exhibit D-11 is the "Management Options"
paper, May, 1979.

You will see that at the
bottom of the text, page 3, D-10, and on page
four of Exhibit D-11 that there are a number
of names under the heading: "Caribou Technical
Committee," one of which names is "G. Calef".
Is that you, sir?

A. Yes, it is.

Q. Are you a member of
this "Caribou Technical Committee"?

A. Yes, I am the
Northwest Territories' representative on the
committee.

Q. We have heard yesterday
from Mr. Miller that this Caribou Technical
Committee consists of representatives of the
Northwest Territories Government, Northwest
Territories Wildlife Service, of the Canadian
Wildlife Service, Department of Indian Affairs,
the governments of Manitoba and Saskatchewan, is

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2334.

G. Calef, ex in chf
(Chambers)

that correct?

A. That's correct.

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Q. Can you tell the court how these two papers, D-10 and D-11, came into existence and at what time?

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A. The drafts that you see here came into my hands in this form a week ago today. They are the results of discussions that the Caribou Technical Committee had at a meeting in Yellowknife, the date of which I am not sure about, but I believe it was in March, and we formulated a draft of this which was then edited and submitted back to the members for their comments -- and then these comments were incorporated and this is the final version of that process.

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Q. So you say that this final draft was formulated in March of this year?

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A. No, not the final draft. The initial meeting that started this process was, I believe, in March. I'm sorry, I don't know the dates. I could find out, but I don't know them offhand.

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Q. So far as you know, was this meeting in March -- were there prior meetings, also, on this subject matter?

A. Pardon me?

Q. Were there prior meetings?

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2335.

G. Calef, ex in chf
(Chambers)

A. Yes, there were. The Caribou Technical Committee meets once or twice a year routinely to update the information on the Kaminuriak and Beverly Herds and to discuss what research should be done and what management steps should be recommended to the caribou management group.

Q. Yes, and when did the first meeting concerning the subject matter of Exhibits D-10 and D-11 take place -- the first meeting on the Kaminuriak Herd? When did the first meeting take place?

A. This subject matter is always the subject of our meetings. The purpose of this committee is to bring together the scientists who are studying these herds to make each other familiar with their findings, to discuss techniques and to discuss the implications of the findings for the management of the herd, so it is an ongoing process.

Q. Was this law suit, sir, discussed at any of these meetings?

A. Not as part of the official deliberations of the group. This was an ominous cloud on the horizon that there might be a law suit and that we might be taken out of our research in the fields to come here and testify and so on. But these were just informal

discussions among members.

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Q. In the formulation of the views which finally became embodied in Exhibits D-10 and D-11, did any consideration enter into the formulization of these views having regard to this law suit?

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A. No.

Q. There was some discussion yesterday, sir, about certain computer model -- and if you would look at Exhibits D-10 and D-11 -- that mentioned this computer model and certainly data or information was fed into this computer?

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A. Yes.

Q. Can you shed more light on this, and particularly also concentrate on such things as, first of all, the question of fertility rate of the Kaminuriak Herd and, secondly, of the numbers killed. Let's take them one by one. First of all, with regard to the computer model would you just explain what that was?

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A. Yes, all the computer model is, is a very simple bookkeeping device which allows us to take into account our knowledge of the processes that are going on in the caribou herd.

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Any change in numbers in a herd can only be the result of the balance of

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2337.

G. Calef, ex in chf
(Chambers)

births and deaths in the herd, and we have certain information on the numbers in the herd, birth rates and death rates.

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All this computer model is, is a way of letting us see the consequences of these rates for the herd.

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We can and have arrived at the same numbers with a pencil and paper. There is nothing mysterious about it. I can go into detail about how one would do the computations. You start with the population size in a given year, you know that these animals produce approximately a certain number of calves, you know that these calves survive at a certain rate -- so you can tell how many will be remaining in the population at the end of the year. This is the addition to the population. Then you simply subtract the number of animals that are known or estimated to have died in the population. The result is a net change: either an increase or decrease. That is all we have done.

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Q. In your view how reliable are the data put into this computation?

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A. Well, they are certainly the most reliable data available. We work with what we have. There is good reason to believe that there is some source of error associated with

G. Calef, ex in chf
(Chambers)

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almost every value that we use. But, we use the best methods available and we make our predictions based on that.

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Q. And do you have confidence in the result that is expressed in Exhibits D-10 and D-11?

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A. Yes, I do. I am not saying that -- when we say that there are 44,000 animals in a caribou herd we don't believe that there may be 44,010 or 46,000 or 40,000. It is an estimate. We are aware that there is certain error associated with it.

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Similarly, when a kill from a community is reported to be a certain number, we believe that it may be higher or lower than that, but that is the estimate that we work with.

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But I think that the trend that we see is so dramatic that even with these errors associated, I have a great deal of confidence in the trend of the population that is indicated.

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Q. Dr. Calef, do you have any doubt whatsoever that there has been a decline in the caribou herd?

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MR. ESTRIN: My Lord, I, perhaps, should have objected to Mr. Chambers' particular question, as opposed to the generalities,

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as I intend to be cross-examining the witness to that issue. That sounds to me as almost a question by way of cross-examination rather than proper examination in chief.

THE COURT: Yes.

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MR. CHAMBERS: I merely asked the witness if he had any doubt about the fact expressed by him and others in Exhibits D-10 and D-11 as to whether there had been a decline in the caribou herd, notwithstanding any possible error in the data that may have gone into the computations.

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THE WITNESS: You are talking about the Kaminuriak caribou herd?

MR. CHAMBERS: Yes.

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THE WITNESS: No, there is no doubt in my mind.

BY MR. CHAMBERS:

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Q. Sir, I asked you about the fertility rate about which there was some discussion. Do you recall, sir, what fertility rate went into this computation?

A. According to point number six on page one of "Management Options for the Kaminuriak Caribou Herd," our assumption was that 69% of the females over one year of age produce one calf each year.

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Q. On what did you base

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2340.

G. Calef, ex in chf
(Chambers)

this assumption, sir?

A. I believe that this is from published information of the Canadian Wildlife Service. I believe it is Gerald Parker's report.

Q. Can you tell the court who Gerald Parker is?

A. Yes; he was one of the biologists who did studies for the Canadian Wildlife Service in the late sixties on the Kaminuriak Herd.

Q. About the kill statistics -- one set of statistics that goes into this computation -- you will see from Exhibit D-10, on page two, you say in the middle of the page:

"The reported hunter kill for the last three years (74-77) has averaged 3718 animals."

We heard from Mr. Miller yesterday and it was stated in his certified statement on page two, paragraph ten:

"During the period 1968 to 1977, the average number of caribou reported killed by hunters was 3,031."

A. Yes.

Q. Do you have any explanation for the discrepancy in these two figures -- 3,031 in Mr. Miller's statement and

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2341.

G. Calef, ex in chf
(Chambers)

3,718 in Exhibit D-10?

A. Yes, there are averages
for different time periods.

The figure that Mr. Miller
is quoting is an average over much longer period.
In fact, in the last three years the number of
caribou killed has been higher than the average
over the ten or fifteen year period previously.

Q. And there was some
suggestion that perhaps the kill statistics that
go into this computation of the size of the
Kaminuriak Herd do not all come from animals
of the Kaminuriak Herd. Can you explain to
me, sir, and the court, how this kill statistics
or reported as kills was computed?

A. Yes, it varies by
community and by year. The basic form is for
the Wildlife Officer in a community to ask each
hunter, once a year, how many caribou he killed
during the previous year. He asks this when the
hunter comes in to renew his General Hunting
Licence.

There may be other information
collected; for example, "Did you kill these
caribou north of Baker Lake-Chesterfield Inlet
access or kill it south of there?" Something
like this.

In some years, hunters were

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2342.

G. Calef, ex in chf
(Chambers)

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asked more often than once a year. They were asked quarterly or monthly for their estimate of the number killed. These data are recorded by the Wildlife Officer and sent to Yellowknife.

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In some cases the Wildlife Officer has made his own judgment based on -- I assume -- where he has seen people hunting or the direction they have gone hunting whether they were hunting animals from, say, the Beverly Herd, or the Kaminuriak Herd, and he has written this in a report and said that he estimates that a certain percentage of the kills from this community would be from the Beverly Herd or a certain percentage would be from the Kaminuriak Herd.

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For most communities other than Chesterfield Inlet and Baker Lake it is quite clear that all the animals come from the Kaminuriak Herd.

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Q. There was some talk about reported kills north of Baker Lake. The question was how certain is it that in fact these reported kills came, in fact, from the Kaminuriak Herd?

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A. Yes.

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Q. There was some suggestion that perhaps some of these animals came from the "Melville" herd? Can you enlighten us on this?

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2343.

G. Calef, ex in chf
(Chambers)

A. I'm not sure -- I don't recall that statement being made. The Melville Peninsula Herd refers to the animals that calve in an area on south central Melville Peninsula.

Q. Can you indicate to the court, perhaps by reference to the map, Exhibit D-8, where Melville Peninsula is?

A. Melville Peninsula is the northeastern tip of the mainland, and it is approximately 300 or 350 miles northeast of the Kaminuriak caribou calving ground.

My opinion is that the chances of animals that would calve on the Melville Peninsula -- and by definition those would be Melville Peninsula animals -- the chances of Melville Peninsula animals being killed by hunters from Baker Lake is quite remote.

Q. And we know also, Dr. Calef, that the people from Baker Lake also hunt the Beverly Herd?

A. Yes.

Q. Undoubtedly, the Northwest Territories Wildlife Service is aware of that?

A. Yes.

Q. What separation is made in reported kills between these two herds?

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2344.

G. Calef, ex in chf
(Chambers)

A. Well, normally,
until the last three or four years, the northern
boundary of the Kaminuriak Herd was considered
to be the Baker Lake-Chesterfield Inlet access
-- this essentially east-west line between
Baker Lake and Chesterfield Inlet. The Canadian
Wildlife Service used that as the northern
boundary of their definition of the Kaminuriak
Herd.

So, in the past one would
just automatically assume that animals killed
north of Baker Lake-Chesterfield Inlet would be
Beverly Herd animals; animals killed south of
there would be Kaminuriak Herd animals.

In recent years there is
some evidence that caribou from the Kaminuriak
Herd have wintered north of Baker Lake. In
those years, the Wildlife Officer has formed a
judgment about the percentage of animals north
of Baker Lake that would be considered Kaminuriak
animals. So, the percentage that is attributed
to the different herd depends on the year and
depends on the distribution of the two herds.

Q. We have heard a lot
of testimony about the Kaminuriak Herd. Can
you enlighten the court about the Beverly Herd:
its state -- whether it is declining or increasing
or whatever?

G. Calef, ex in chf
(Chambers)

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A. My recollection is that there have been four attempts in the last ten or fifteen years to obtain population estimates for the Beverly Herd.

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I will take a guess at when the surveys were done. One was done, I believe, in 1967; the next one was done, I believe, in 1972; the third one was done, I believe, in 1974; and the most recent one was done last year, 1978. Three of these four of them were calving ground estimates -- the last three. The first one was an estimate done on spring migration.

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It seems to me that the first two estimates were approximately 150,000 160,000 caribou. Possibly a little higher.

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The last two have been almost identical at about 124,000. If you take those estimates at strictly face value, it looks as though there has been a slight decline; however, we know there are errors associated with these things, and my personal feeling would be that the safest assumption is that the herd is stable or very slightly decreasing but certainly is not decreasing at the same percentage rate, say, as the Kaminuriak Herd is.

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Q. Dr. Calef, we heard

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2346.

G. Calef, ex in chf
(Chambers)

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evidence from native hunters, some of the Plaintiffs, who have hunted in the Beverly Lake-Schultz area at those crossings there and that last year there were not any caribou crossing in that area. Would you have an explanation for that?

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A. You mean what would be the cause?

Q. Yes.

A. Of this?

Q. Yes.

A. No, I don't.

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Q. You have been quite extensively engaged in the study of the behaviour of caribou; am I right?

A. I would not say that

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behavioural observations have been the major part of my study, but I spend a lot of time around caribou. Let's put it that way.

Q. From what you know

from that source and also from what you know from your studies of the scientific literature in the field, would you say that the caribou can always be counted to cross at the same crossing every year?

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A. No. In most cases,

when caribou herds have been studied over a period of years, when the distribution and movement

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has been studied over a period of years, there is quite a bit of variation both in space and in time.

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The major well known crossings are used the majority of the time by the majority of animals, but there are certain years when the crossing will not occur at all at that particular location. There are times when the winter range that has been used extensively by a major part of the herd for several years will suddenly not be used any longer and this sort of thing.

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The picture is that the longer you study the herd over time the more variation you see.

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Q. Have you had any personal observations in this regard? In other words, that a herd may use a particular crossing or area of migration as opposed to another?

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A. Yes. On the Porcupine Herd --

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Q. If you could tell the court, first, where the Porcupine Herd is?

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A. The Porcupine Herd is the barren-ground caribou herd that occupies the northern Yukon, the very northwestern Northwest Territories and the northeastern corner of Alaska. It is a herd of about 100,000 caribou.

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It is named after the Porcupine River, a tributary of the Yukon, which it crosses normally twice a year in migration -- north in the spring and south in the fall.

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Just to give you an example of the variation that can be expected: one year in which I was studying the Porcupine Herd the animals came from the north to the river, going south, and continued on south to winter ranges in the north central Yukon.

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One or two years later -- I cannot remember whether it was the next year or two years afterwards -- these caribou came from the north to the Porcupine River, they crossed the river, they started south and they then made a big circle to the northwest, recrossed the river and wintered in Alaska, some 200 - 300 miles from the range they had used two years previously. So the northward crossing of the river occurred in one year and not in the other.

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Q. Therefore, does the statement -- assuming it is true -- that the Beverly Herd did not cross between Beverly and Schultz Lakes last year comes as a surprise to you?

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A. No.

Q. Dr. Calef, you have

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2349.

G. Calef, ex in chf
(Chambers)

engaged -- as we saw from your Curriculum Vitae
-- in some aerial surveys of caribou?

A. Yes, I have.

Q. Can you tell the
court which particular herds they were?

A. I have done aerial
surveys on the Porcupine Herd, Bathurst Herd,
a small part of the Blunose Herd, Beverly Herd,
Kaminuriak Herd, the herd or herds around
Wager Bay and the Melville Peninsula Herd.

Q. And have you had
occasion to observe the behaviour of caribou
or their responses to aircraft?

A. Certainly.

Q. Could you tell the
court what they were and under what conditions?

A. Well, the responses
are quite variable. The most outstanding and
obvious factor is how far or how far away from
the caribou you are. The farther away you are
-- whether it is up or to the side -- the less
likely they are to respond to the aircraft,
and I have just seen the entire gambit from
animals that are running very hard to escape
from an aircraft to animals that make no response
that I can observe. They continue to do whatever
they were doing before and make no efforts to
flee.

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2350.

G. Calef, ex in chf
(Chambers)

This is the case both where aircraft have flown over the caribou and also where it has landed beside them or near them.

Q. Have you also had occasion to observe how long this reponse -- this galloping, say, in its extreme sense, would last -- or any lesser forms -- perhaps you can enlighten the court on that -- after an aircraft or helicopter has passed or been removed from the area?

A. Yes, that also varies, but my experience is that if an aircraft is flying in level flight at, say, an elevation above 300 feet, if the animals do respond to the aircraft by running or walking to one side or the other, they will stop running within a few hundred yards; normally, within just a few seconds, which I would imagine would be just a few hundred feet.

Q. Have you ever observed any long-term effects as a result of this stress that would be induced by flying aircraft?

A. No.

Q. Is there any evidence, so far as you are aware, Dr. Calef, that caribou are abandoning ranges as a result of activities that are usually associated with mining explorations

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2351.

G. Calef, ex in chf
(Chambers)

-- including aircraft?

A. The only case that I am aware of concerns the Alyeska Pipeline and haul roads in Alaska. That is not mining. It is petroleum.

But there has been a series of papers published by biologists from the Alaska Department of Fish and Game which indicate that cow and calf seem to avoid the vicinity of the pipeline haul roads during the spring and summer months. This is an avoidance of part of the range for a certain time period. They made the point that in terms of overall distribution on the range, this has not changed. But, certainly, the spacial pattern of use has apparently changed.

Q. As a result of the construction of the Alyeska Road?

A. I think I am correct in saying that they have no observation on what the caribou did in that area prior to the construction, but their paper is based on the observation of the proportion of cows and calves in areas near the pipeline and away from the pipeline road, and there is much higher proportion of calves in among the caribou that are distant from the haul road.

Q. Is there any evidence,

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2352.

G. Calef, ex in chf
(Chambers)

though, about caribou abandoning ranges as a
result of exploration activities of the kind
that we have in the Baker Lake area?

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A. No, I am not aware
of any.

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The two herds that I
can think of that have probably experienced the
most aircraft harassment. I shouldn't say
harassment -- the most use of aircraft on the
ranges, have been the Porcupine Herd and the
Bathurst Herd.

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I show you where the
Bathurst Herd is. The Bathurst Herd is the
herd that winters in the forests north of
Yellowknife and uses the tundra to the northeast
and calves just to the east of Bathurst Inlet.

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Q. Just for the record,
you were pointing to Exhibit I-8.

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A. The aircraft on the
Porcupine Herd range were mostly used for
environmental research, pipeline studies --
possibly some mining and petroleum exploration
in the winter. The aircraft activity on the
Bathurst Herd has been mostly mining activity,
and there is quite extensive exploration in that
area.

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And, as far as we can tell,
within the variations of movement that I spoke about

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before, both of these herds are still using the same amount of range, the same areas of range, as they did previously and we believe the populations are essentially unchanged in numbers.

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Q. In the computation of the population of the Kaminuriak Herd -- its decline -- the way it is stated by Mr. Miller and the way it is outlined in Exhibits D-10 and D-11, did any considerations of aircraft activities enter into these computations?

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A. In what way?

Q. Any way whatsoever that may have caused the decline in mortality rate, for example.

A. No.

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Q. Can you tell the court why this was not assumed?

A. Well, the only numbers which we used in this computation are birth rates and death rates, and these are either measured imperically -- that is they are observed in the field -- or else they are estimated by difference between other values. So, if aircraft were having an effect on mortality, for example, that would be included in the mortality rate we used in the model.

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unusual about the mortality rate in the Kaminuriak Herd other than hunting, as compared to other herds?

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A. No, the mortality rate which we use, which was for natural mortality of adult caribou in the Kaminuriak Herd was 7.2%. This total was estimated by difference.

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Now, we have an estimate based on the Canadian Wildlife Service work for wolf predation -- the contribution of wolf predation, which is approximately five percent.

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Okay. So, if you subtract the contribution of wolf predation from 7.2% you get 2.2%. This is the mortality from all other factors -- all other "natural" -- and anything that would be attributed to aircraft would be included in that category. This figure is towards the low end of what has been estimated for most caribou herds for non-predatory mortality.

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There have been studies in several herds in Alaska, in Newfoundland and -- well, those are the herds that I know of -- which indicate that one would expect in a normal caribou herd, even without predation and even without large amounts of human activity, that something like two to five percent of the caribou would die from natural causes, so that fits very well with the estimates that we have

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2355.

G. Calef, ex in chf
(Chambers)

for the Kaminuriak Herd.

Q. What is the reaction of caribou to stationary objects on the ground; for example, we heard a lot of testimony about oil drums. How do caribou react to oil drums?

A. I cannot think of very many instances when I have observed this.

One thing I can think of: we had a base camp at the old Hudson Bay post at Wager Bay in the summer of 1976 and 1977 which consisted of three or four buildings and our tents, and there was a lot of drums that were left there by the Hudson's Bay Company and by other people. We had almost continuously caribou right around camp and they made almost no response that we could see to the buildings or to our tents or anything else.

I have photographs that I have taken of these animals from twenty feet away. I have pictures of them grazing between the buildings and my tent, and so on. That is one example.

I would say, in general, caribou usually will not avoid stationary objects. A pile of drums could be a pile of rocks except for the smell, perhaps.

Q. How are they likely going to react to the presence of humans?

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2356.

G. Calef, ex in chf
(Chambers)

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A. It depends entirely on what the human beings are doing and, to a lesser extent, the time of year and the sex and age of the animals.

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Cows with calves on the calving grounds, if they see human beings walking towards them, will walk away and leave their calves away when the humans are 300 or 400 yards or even more, occasionally, away.

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At the other extreme would be those caribou at Wager Bay, which were mostly males and young animals and they allowed human beings to walk in plain sight and moving at a slow-to-normal pace, but not sneaking -- not hiding behind bushes or anything -- just walking within plain sight -- to twenty to thirty feet and anywhere between those two extremes.

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Q. How do caribou react

to sounds? Say, a steady sound, for example, such as a diamond drill going?

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A. I have never seen them

react to a sound like that. I have never seen them react to a diamond drill.

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I have started up aircraft -- or the aircraft I was using has been started up by the pilot when it is on lakes where caribou are resting or standing without them taking flight,

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2357.

G. Calef, ex in chf
(Chambers)

without them even moving. There are studies published -- in conjunction with the Mackenzie Valley Pipeline research -- on compressor station noises and things like that. These are quite loud recorded sounds of compressor stations, and they indicate that the caribou react only slightly. They deflect less than a quarter of a mile, I believe. I forget the exact figures, but there are figures. There is some reaction, but it is not large.

Q. You mentioned, sir, the Wager Bay herd. Could you elaborate on this. There seems to be some suggestion that perhaps some of the Kaminuriak Herd went up there and became the Wager Bay Herd. What is your view of this? Could you indicate on Exhibit I-8 where Wager Bay is, so we see where we are?

A. Wager Bay is the next large inlet north of Chesterfield Inlet. It is about 180 miles - 150 miles north of Chesterfield Inlet.

I think there have been reports published by the Northwest Territories Wildlife Service that call the caribou north of Wager Bay -- there is a calving ground north of Wager Bay. Those are the Wager Bay caribou. There is another herd that calves at the headwaters of the Lorillard River, which is south of Wager

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2358.

G. Calef, ex in chf
(Chambers)

Bay, that is called the Lorillard.

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We do not have any information as to whether the animals using those two calving grounds meet at other times of the year or not; for example, many years there are two calving grounds for the Beverly Herd; one southwest of Beverly Lake and one northeast.

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Perhaps, if someone had seen that -- just the calving ground -- the first time, they might have said, well, you know, that is two herds: one north and one south of Beverly Lake. We know now that it is one herd.

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But, in answer to your question about the numbers of caribou around Wager Bay, as far as I am aware there was no quantitative survey of numbers north of Chesterfield Inlet done until 1976, so there is no way of really assessing whether there has been an increase in caribou numbers around Wager Bay. We just have no information previously.

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Q. Is there any evidence of any Kaminuriak Herd caribou that went into that area?

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A. No. There is evidence that there were animals north of Baker Lake and Chesterfield Inlet during at least one winter, which was the winter of 1975-76, that subsequently were followed in a circle to the southeast, back

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to the Kaminuriak calving ground.

Maybe I should say a word here about what we mean when we talk about caribou herds. A caribou herd is defined as the group of animals which go to a certain specific area to calve. Kaminuriak Herd is named after its calving ground near Kaminuriak Lake; Beverly Herd is named after its calving ground near Beverly Lake; and so forth. Therefore, if animals go north of Chesterfield Inlet and return to the Kaminuriak Lake calving ground, they are Kaminuriak animals. If animals went from the Kaminuriak Herd to Wager Bay and calved there, then they would be Wager Bay animals at that point.

There is some evidence from other herds that there is exchanges between herds like this. In terms of numbers, if there had been any large emigration from the Kaminuriak Herd to other herds, then our feeling is that the herd would have declined even further and faster than we have observed.

Q. Just one more question. Referring to Exhibit D-10 and D-11, you say that you subscribe to these documents. Does that mean that you subscribe to all the views expressed in these two documents?

A. Yes.

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2360.

G. Calef, cr-ex
(Graham)

MR. CHAMBERS: Thank you.

No further questions, sir. Your witness.

CROSS-EXAMINATION

BY MR. GRAHAM:

Q. Dr. Calef, are you familiar with an address which was given by Norman Simmons, of the Northwest Territories Wildlife Service, at the American Wildlife Conference, March 27, 1979?

MR. GOLDEN: I just point out here again, my concerns are still there, but, in addition to that, I have an additional concern. My friend's interest in respect of the evidence of this witness, judging from the Affidavit that he has filed on behalf of Mr. Banfield, seems to be identical.

Perhaps he ought not be allowed to cross-examine this witness in the ordinary way of leading him through other material. In effect, Dr. Calef would then become my friend's witness.

THE COURT: You are obviously anticipating something that I cannot.

MR. GOLDEN: I can only anticipate at this time. I don't know what Mr. Simmons has said or not said, but I know my friend would wish to introduce it. He is doing it by cross-examination. The witness was called by the Department of Justice but, on the

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other hand, it is quite clear from his evidence, most of which I think I will later on argue is totally inadmissible, that he is in the same interest or certainly saying the same kinds of things that Dr. Banfield is saying in his Affidavit. My friend is, in effect, getting a free shot at cross-examination in an area which is already somewhat questionable.

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I think he ought be restricted to open questions; not allowed to cross-examine.

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THE COURT: What is your

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MR. GRAHAM: I beg your pardon, My Lord?

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THE COURT: I say what

is your view?

MR. GRAHAM: Well, I hadn't started to examine crossly or even chiefly.

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THE COURT: Well, you have a better idea, obviously, than I can possibly have as to the --

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MR. GRAHAM: In view of the anticipatory response of this harassment on my part, My Lord, let me point out that Dr. Calef is one of the authors of this paper, and I do not intend to put it to him for the purpose of contradicting his evidence. I intend

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2362.

G. Calef, cr-ex
(Graham)

to put it to him to ask him if he is still
of the view of certain opinions which were
expressed in that paper.

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MR. GOLDEN: That is
precisely my point, My Lord. I do not expect
him to contradict him at all. I expect him
to be in love with his evidence and build it
up more and more and more but all my putting
other papers to him.

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You cannot put a paper
to a witness without cross-examining -- not
really.

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MR. GRAHAM: In that case,
My Lord, if all my friend's evidence that he
puts to any of his witnesses by way of paper
before you that he wants to take away --

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MR. GOLDEN: That's not
what I meant. You know better than that.

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MR. GRAHAM: That is not
a proposition of evidence or a rule of procedure
that could possibly work. In evidence in
chief you could never put any paper to a witness
you're examining in chief that he had written
himself.

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THE COURT: You go ahead,
Mr. Graham, but try not to lead the witness too
far.

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BY MR. GRAHAM:

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Q. Perhaps, Dr. Calef,
I could first show you a paper which was presented
to the American Wildlife Conference. I understand
it was presented by Mr. Norman Simmons; is
that correct?

A. That is my understanding.

I was not there.

Q. Are you shown as being
one of the authors of that paper?

A. Yes, I am.

Q. Did you participate
in the drafting of all the paper?

A. Yes.

Q. Are you in agreement
with the opinions expressed in that paper?

A. Yes, for the most
part.

MR. GRAHAM: I would like
to --

MR. ESTRIN: I object,
My Lord.

Could we have a look,
Mr. Graham? We do not have all your sources.

MR. GRAHAM: I intend to
put this forward as --

I would like to have this
marked as Exhibit --

MR. GOLDEN: I would

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2364.

G. Calef, cr-ex
(Graham)

strenuously object to it being marked as an exhibit. I object to it being put to the witness. My friend is, in effect, dealing with what could almost be his own witness, he is now going to ask him -- he has asked him if he agrees with the paper, and he will then put the paper in as an exhibit and, presumably, go from there and rely upon it as evidence later on. All of this, My Lord, without any indication in advance that Dr. Calef was going to testify.

Against the background of other objections, I must refer to them now. I think, My Lord, this is not only an abuse of Rule 482, also an abuse of the common standard which is applied when a witness, who is called by a party, who is in the same interest -- you can identify it by witness in issue -- is being called. My friend is not adverse to this witness at all. He is trying to stick evidence in through this witness -- call his own evidence.

MR. GRAHAM: My Lord, I quite concede my friend's point that I am not in adverse in interest to this witness, and if the witness gives me an answer on examination, which I do not like, I would agree that I am not in a position to then attack his credibility or attempt to cross-examine him or get around the answer or something like that. I am sure

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2365.

G. Calef, cr-ex
(Graham)

the court will stop me if I do attempt such.

But I do not find it a proposition of law or procedure with which I have ever been familiar where it is suggested that you cannot put documents to your own witness. If I call Dr. Banfield I intend to ask him if he swore the Affidavit that we are going to have before us.

Is my friend going to say, "Oh, that's his witness. He can't put that document to him"? That is absurd. I do not understand how we could proceed in the trial if in fact that were a rule that we were to observe.

THE COURT: I-10.

EXHIBIT NO. I-10: Document presented by N. M. Simmons at the American Wildlife Conference, Toronto, March 27, 1979.

BY MR. GRAHAM:

Q. I would like you to turn to Exhibit I-10, Dr. Calef, page 14?

A. Yes.

Q. I'm sorry. Turn to page 15.

A. Yes.

Q. Second paragraph.

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2366.

G. Calef, cr-ex
(Graham)

A. Yes.

Q. Would you read the
two paragraphs -- the second and third paragraph
on that page?

A. Tell me the words that --

Q. "In defence of the
beleaguered caribou ..."

A. "In defence of the
beleaguered caribou, there resulted from
K.I.A.'s intervention a flood of money
and manpower ..."

Q. May I just stop you
there. What is K.I.A.?

A. I believe it is Keewatin
Inuit Association.

Q. All right

A. "... the like of which
has rarely resulted from a wildlife
manager's plea. Literature was
searched, and caribou movements were
monitored as the animals moved in and
out of the land-freeze area. Only in
the absence of caribou were prospectors
allowed into the area. Monitoring
and research will continue at least
through the summer of 1979."

Do you want me to continue?

Q. Yes.

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A. "This flurry of activity overshadowed the main problem with caribou - their decline for reasons unrelated to the activities of the mineral industry. Nevertheless, the K.I.A. spawned a new policy of special land management zones and land use permit conditions designed to protect Kaminuriak and Beverly caribou."

Q. Now, is that opinion that the decline for reasons unrelated to activities in the mineral industry -- is that one of the opinions which you say you were in agreement that were expressed in this paper?

A. Yes.

Q. If I refer you to page

--

MR. GOLDEN: I just want to point out here now, My Lord, the basis of my objection.

This is an opinion of the witness as to activities of the Keewatin Inuit Association, and then we go to a paragraph: "This flurry of activity overshadowed the main problem with caribou ...". That is the witness' version of the main problem of the caribou.

"...their decline for reasons unrelated to the activities of the mineral industry."

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2368.

G. Calef, cr-ex
(Graham)

My friend picks that out
and asks, "Do you agree with that?"

Now, that is not an
appropriate use of a paper such as this and that
is not an appropriate use of these paragraphs.

It then goes on to talk about:

"The policy was announced in April
1978 and is applauded by wildlife
managers as a step that should be taken
in favour of all caribou herds."

You know, that is propaganda
for us. We do not need propaganda, My Lord,
in this particular case. We have enough problems
already without having to deal with it on that
basis.

My Lord, I've made the
objection. I am only going to make it once more.
Surely this is the time for some restraint.

MR. GRAHAM: Well, if my
friend wants to emphasize the propaganda aspects
both of the case and what is going in, that is
fine. My question was directed to the opinion
as to the mineral activities --

MR. GOLDEN: Buried with
two paragraphs in front of it.

BY MR. GRAHAM:

Q. And I would like to
refer you, sir, to page 18, the second paragraph.

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2369.

G. Calef, cr-ex
(Graham)

A. Yes.

Q. Read that paragraph,
please.

A. "The population of caribou
hunters is increasing as a result of
high birth rate and infant survival."

Q. Can I stop you there?

A. Yes.

Q. What is that opinion
based on?

MR. GOLDEN: Biological
studies, no doubt.

THE WITNESS: To be quite
honest, I'm not sure of the source of those.

BY MR. GRAHAM:

Q. You cannot speak to that?

A. That's right.

Q. Okay. What about the
next observation?

A. Would you like me to
read it?

Q. Yes.

A. "Also, since the late
1960's the native Keewatin hunter has
become so mobile with motor toboggans
and aircraft that game can no longer
elude him and his high-powered rifle.
However, attitudes and laws have not

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2370.

G. Calef, cr-ex
(Graham)

changed to accommodate population growth and the hunter's new ability to dictate the welfare of wildlife."

Q. Can you tell me from your experience as a Wildlife Manager and your experience in the Keewatin what your second sentence in respect of the Keewatin hunter's mobility is based upon.

A. It is mostly based on conversations with wildlife officers on the use of skidoos or motor toboggans for hunting.

Q. Were these conversations made during the course of your official duties to collect information on state of the game population and herd population?

A. Yes, both official and unofficial.

Q. Are you familiar with the use of aircraft for the purpose of hunting caribou?

A. Yes.

MR. GOLDEN: My Lord, surely the licence Your Lordship gave my friend -- all of my friends -- to bring in evidence that might not be strictly speaking rebuttal has to have some limits to it.

This is about the so-called overkill situation, which is one of the areas of

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2371.

G. Calef, cr-ex
(Graham)

my specific objection.

My friend, as Your Lordship is aware, may have got into the area through the witness, but this is just a deliberate attack in that area. It has nothing to do whatever with rebuttal evidence.

THE COURT: I am concerned with the witness in his expertise that would lead him to come to conclusions as to these matters.

MR. GRAHAM: He has been qualified as a man who has been in the area and he was directly concerned with the wildlife management of this herd and he is familiar with the conditions that go in terms of the hunting of it. He has given evidence in chief that, in fact, they have come to the conclusion that the over hunting of the herd is the primarily reason for its decline. And I think this speaks to the way this comes about. I just asked him the question as to whether he was familiar with the use of aircraft for the purpose of hunting caribou, and his answer was yes. It sort of got lost in the objection. But I think I am entitled to put that question to him.

It is perfectly proper rebuttal in view of the evidence that has been led in terms of aircraft, their presence around

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the herd and the effect they might have on the herd.

MR. GOLDEN: We are talking about aircraft for hunting.

THE COURT: Aircraft for hunting has only been mentioned once, as I recall. In cross-examination by Mr. Estrin of Mr. Miller is the only time I can recall the subject coming up.

MR. GRAHAM: Right. Exactly. Exactly Mr. Estrin's question opened it up.

THE COURT: If it was in an answer rather than a question, I am not sure. Go ahead, Mr. Graham.

BY MR. GRAHAM:

Q. Are you familiar with the use of aircraft for the purpose of hunting caribou?

A. Yes. Not so much on the Kaminuriak range as in other areas.

Q. Are you familiar with instances of it in the Kaminuriak range?

A. I cannot think of any offhand.

Q. Okay.

A. Oh, I'm sorry, yes, I have heard reports from --

MR. GOLDEN: No, I object.

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2373.

G. Calef, cr-ex
(Graham)

THE COURT: This is a problem here. We are into hearsay; not opinion.

MR. GRAHAM: Well, My Lord, if the reports were received in the normal course of this official's duties --

THE COURT: Find that out.

MR. GRAHAM: -- in respect of his game management procedures, then it is not hearsay.

THE COURT: You find that out.

BY MR. GRAHAM:

Q. In the course of your game management responsibilities, Dr. Calef, do you receive reports as to hunting from the various game managers?

A. Yes, in the case that I just recall --

Q. In the Keewatin do you receive these reports?

A. I don't receive them in the Keewatin.

Q. Where do you receive them?

A. In Yellowknife.

Q. From the Keewatin?

A. Yes.

Q. Fine.

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A. The case that I had just recalled here is last fall there was a meeting between hunters representing the various Inuit and Indian communities which hunt the Kaminuriak Herd, with the wildlife biologists from Saskatchewan, Manitoba, and the Northwest Territories in Thompson, Manitoba.

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The purpose of this meeting was to get the hunters together with the biologists to exchange views to try to arrive at some understanding of whether there was a problem and, if there was, what caused it and what could we do about it.

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At that meeting there was discussion -- I think it was by the Chief of Tadouly Lake, regarding the use of small aircraft by the Indians in Manitoba for hunting caribou.

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He said that yes, on some occasions in the last few years Indians hunters had flown out and hunted caribou, which were presumably Kaminuriak caribou, using aircraft.

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Q. In your paper you refer to caribou as being a gregarious -- and you use that word specifically -- and you gave evidence in chief of them having been sighted by you in camps where you were located. Can you explain to the court why you use the term "gregarious" in respect of these animals?

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2375.

G. Calef, cr-ex
(Graham)

A. Well, large segments of the population often get together in very close proximity and travel together and tolerate each other in a way that is not seen among other ungulates; for example, in a moose population in an area you would not see herds of the type that you see with caribou or with white-tailed deer, under most conditions, and so on.

Q. I refer you to page 19 where, in the second paragraph -- I do not want to get into what my friend might call propaganda and we will leave that aspect, but I think I have to read you the whole sentence in order to make sense.

"They ..."

And I presume that is a reference to Inuit hunters, is it?

A. Yes.

Q. "... protest against prophesies of doom for caribou when thousands of the gregarious beasts swirl around the villages."

What are you referring to there?

A. Well, this is not my writing.

Q. Okay. Are you in agreement that these animals do come in close

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2376.

G. Calef, cr-ex
(Graham)

contact with villages, as is suggested by that sentence in that report?

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A. Yes, on occasion they do.

Q. Is that based on your own personal experience and observations?

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A. Not on the Kaminuriak Herd.

Q. With respect to some other herds?

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A. Yes.

Q. Other barren-ground caribou?

A. Yes.

Q. The Porcupine Herd?

A. Yes, and the Bathurst

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Herd.

Q. Is it based on your observations and experience from reviewing the literature?

A. Yes.

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Q. Yesterday, Dr. Calef, Mr. Estrin referred, in the cross-examination of Mr. Miller, to an article which was taken from the proceedings of a symposium workshop held in Alaska, November 17 and 19. He referred to a paper which you had delivered there?

A. Yes.

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2377.

G. Calef, cr-ex
(Graham)

Q. In that paper did you have a table entitled Table 2? I'm showing you that table. Is that part of the paper?

A. Yes, I believe it was.

MR. GRAHAM: I would like to have this identified as the next exhibit, if I may, My Lord.

THE COURT: I-11.

MR. ESTRIN: Perhaps, Mr. Graham, you could give me a copy of the paper you are referring to.

MR. GRAHAM: Sorry. Did your paper not --

MR. ESTRIN: No, I have a different date.

MR. GRAHAM: Excuse me, My Lord.

---OFF RECORD DISCUSSION

THE COURT: We will take our ten minute break and perhaps we could verify this.

---Short Recess

---Upon resuming after recess

MR. GRAHAM: My Lord, there are certain differences between this table and the one contained in reference to the article that Mr. Estrin referred to yesterday and it would

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take time to explain the editorial nature of them. The evidence is already in, so I will just withdraw that.

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THE COURT: I don't think it was marked, anyway.

MR. GRAHAM: That concludes my questioning of the witness.

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THE COURT: Thank you.

MR. HEINTZMAN: No questions, My Lord.

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THE COURT: Mr. Golden?

MR. GOLDEN: Mr. Estrin

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will be cross-examining this witness, but I have had an opportunity during the recess to read this paper, Exhibit I-10. Now, I am making a request at this time that it be withdrawn as an exhibit and it not be considered part of the evidence.

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First of all, my friend

referred the witness to two particular passages from it. Many papers have been read to witnesses in that way. And the statement of the witness with respect to that particular passage is on the record: that is the quotation and whether he agrees to it or not.

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The paper itself, if Your

Lordship has an opportunity to read it, Your

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Lordship will see it is a discussion of management

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techniques and interjurisdictional problems. The scientific material in it is limited to a few paragraphs of fairly common understanding that has already been testified to now on more than one occasion. The balance of the paper has to do with a critique of the way various government departments, native populations and others have dealt with the problem, and the author's suggestions for dealing with them.

We may have got into many fields -- some of them inadvertently -- in this case, but, certainly, if we get into that one -- I am somewhat mindful of the state of the record in this case and I, for one, would like to see it cleansed of anything that does not at all relate to the issues in this action.

I would ask my friend to agree to that. I do not know whether he will or not. But I certainly, without his agreement, think Your Lordship -- it was tendered to Your Lordship as though it had been identified by the witness. That may be true. But the question of relevancy, of course, could not be determined until we all had a chance to read it.

MR. GRAHAM: My Lord, I am quite happy to have the record cleansed of any document which does not help my client's case either, but I do not think that is a reason

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for withdrawing this particular paper.

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I do not agree with my friend that it is irrelevant. I certainly agree that there is a discussion of management techniques in here. There are also discussions of the issues we have really been debating before Your Lordship for the last couple of days, and it goes to the core of this case because my friend's case is there are no caribou in certain areas because mineral exploration activities have driven them away. If that is not his case, then we should not be here before Your Lordship.

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Our reply to that is that there are no caribou in those areas because this herd has been decimated by various reasons, one of them being by over hunting. That seems to me to be a core-issue of this case.

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This paper addresses itself to that problem. I am perfectly confident that Your Lordship is capable of looking at those passages in the paper which are relevant, and if we cite something in argument to Your Lordship which you consider is not addressed to the issues before you or which should not properly be in

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evidence, then I think you will say, "We are disregarding that", but this man, who has been qualified as an expert, shown to be familiar with these problems, shown to be familiar with

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this whole area, has now identified this paper as one which he is one of the principal authors. There are three authors and he is one of the authors.

I do not see how else I can do it. Now, if my friend wants to take the approach he just did with Your Lordship, I respectfully suggest I should be given the opportunity then to read all the passages to the witness -- which I wanted to spare Your Lordship and my friends the requirement of -- that I want to get into the record.

Let me refer to what my friend said in his opening. He said:

"Mining exploration activity in the Baker Lake region has created substantial interference for caribou hunting and continues to do so: firstly, by interfering with the movement of the caribou, diverting them and thus making them less accessible to hunters; secondly, by reducing their energy balance and reproductive activities, resulting in herd depletion and reduction of the range movement of the caribou; thirdly, by generally increasing the level of human activity from previous levels to levels not compatible with

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caribou life, with special reference
to sensitive times in the life circle."

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And that seems to me what
we are addressing ourselves to at this moment in
the trial.

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THE COURT: I did have a
chance to look at the conclusions of this
document, and it does seem to be aimed at a -- if
I may say so -- a plea to those around to
assist in the game management and to assist
people that are engaged in that activity.

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I suspect that the
preceding prose is cast in somewhat more
colorful terms than would have been the case
had it been aimed at a scientific journal,
strictly a scientific document, and I can assure
you, Mr. Golden, and perhaps warn you, Mr. Graham,
that I think it is to be read in that context.

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Strictly speaking, I do
not think I would rate it as a scientific document.

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I don't know whether Mr. Estrin will pursue this
in his cross-examination or not, but it is not
quite the same sort of scientific presentation
that we have had from other people in evidence.

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I think the thing has been
marked and it should stay in but I do not know
whether you can take any comfort in the view I
have expressed as to what its character seems to
be, Mr. Golden, to me.

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MR. GOLDEN: I just may have to
explain it from time to time, and I would rather not.

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CROSS-EXAMINATION

BY MR. ESTRIN:

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Q. Doctor Calef, one of the earlier things you were asked about was whether or not you would be surprised if there were not so many caribou around the Kazan Falls area. I think you stated it was your understanding from speaking to Canadian Wildlife Service biologists that this range is peripheral. That is essentially what you said?

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A. What I mean is it is my recollection that the Kazan River area would be the western edge of the summer range of the Kaminuriak Herd.

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Q. The western edge of the summer range.

A. Yes.

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Q. When you say it is your recollection, is that based on your own work or just from literature?

A. No, from the literature.

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Q. What periods of time would you have in mind?

A. Late 1960s.

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Q. When you say the summer range, would that include the calving and post-calving season?

A. Yes.

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Q. I was curious about that. I wanted to show you Mr. Parker's study, Biology of

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the Kaminuriak Population of Barren-Ground Caribou,
Part I. Is this perhaps the study that you were
thinking of?

A. Yes.

Q. It really starts at
page 32, if you want to start at post-calving
aggregations. Would you agree with me that the
first paragraph on that page reads as follows:

"From July 12 to 18, 1966, scattered
post-calving aggregations, numbering
from 75- to 15,000 each, personal
estimates, were located south of
Baker Lake from Kazan River to
Cross Bay on Chesterfield Inlet."

It goes on to say something about aerial photographs.

A. Yes, you read it correctly.

Q. It goes on in the next
paragraph:

"On July 14, 1967, post-calving
aggregations were again observed
south of Baker Lake. Those
groups plotted on this date are
shown in Figure 9."

I forgot to read-- going back
to the first paragraph-- the groups he was referring
to south of Baker Lake in 1966 are shown in Figure 8,
is that correct?

A. Right.

Q. Now, if we look at

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Figures 9 and 10, would you agree with me-- first of all, I take it you have been to the Kazan River and the Kazan Falls?

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A. Yes, not very much but I think I have been there or near there.

Q. What do you mean you think?

A. Well, I would have to look at the maps that I used for my surveys at that time.

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Q. You mean you would be there in an aerial survey?

A. That's right.

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Q. You have not been there on the ground.

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A. No, I have not.

Q. I see. Are you able to point out on either of these maps that he has referred to, showing the distribution of post-calving caribou aggregations observed south of Baker Lake in 1967 and 1968, where Kazan Falls is?

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A. Well, here is the Kazan River. I think that's Kazan Falls here.

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Q. You are pointing, let us say, on Figure 10-- perhaps we can just make an X. Would you like to make an X where you say Kazan Falls is, roughly speaking?

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A. I am not sure exactly where it is. I would think it would be in this area here.

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Q. You have marked with a

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small brown X on Figure 10 from this publication I have referred to earlier.

Would you agree with me, assuming that you are right about the location of the Kazan Falls, that in both those years Parker's study showed there was considerable movement and activity in these months in the vicinity of Kazan Falls?

A. Yes.

MR. ESTRIN: My Lord, I would ask that these two charts be marked as an exhibit. I will undertake to provide a photocopy. I doubt we need to put in the whole book. Figure 9 and Figure 10 could be given exhibit numbers-- numbers reserved for them-- then I will undertake to produce photocopies.

MR. GRAHAM: Could I ask on what basis it is going in; is it without the accompanying text?

MR. ESTRIN: Without the accompanying text.

MR. GRAHAM: Is it being submitted for the proof of the contents of what is on the map or the fact that the witness indicated that that is what is on the map?

MR. ESTRIN: For the proof of the contents that the witness indicated what is on the map because it goes to what he said earlier. It goes contrary to what he said earlier.

MR. GRAHAM: Well--

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THE COURT: It may.

MR. ESTRIN: It may.

THE COURT: If there is an indication of caribou activity to the west of the Kazan River.

THE WITNESS: That's right.

If I--

THE COURT: If all the activity shown on the map is to the east, it seems to me quite consistent with what he has said.

MR. GRAHAM: The map I am looking at--

THE COURT: I don't know. I have not seen it.

THE WITNESS: Yes, I would say that this supports my statement that my understanding was that in the years of these studies the Kazan River was the western boundary of the major distribution of the Kaminuriak Herd; that is that there were not large numbers of caribou observed to cross the Kazan River or to travel far to the west of the Kazan River. That is what I mean by periphery-- the edge.

BY MR. ESTRIN:

Q. I see. I am sorry.

Because I thought--

A. Basically, if one draws a line around the areas in which Kaminuriak Caribou are found, that line is referred to as the periphery, or the edge, and I would say the Kazan River is the

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periphery.

Q. I am glad of that clarification, because I thought you were trying to say-- and perhaps it is my misunderstanding-- that the Kazan area generally in the area immediately south of Baker Lake was a peripheral area.

A. No. No, I would not say that. But the Kazan River, in my understanding, in the years that the studies were done was not crossed extensively and the range did not go far west of Kazan River.

Q. Well, would it appear from these charts-- and I take it these are the source of your information on this subject--

A. That's right.

Q. That the migration went right up to the southern shore and along the southern shore of Baker Lake?

A. Yes, and I have seen caribou there.

MR. ESTRIN: My Lord, on that basis I do not think there is any need to put them in.

THE COURT: He certainly identified it as the source of his information, so if you want it in, you've got it.

MR. ESTRIN: Yes, thank you.

BY MR. ESTRIN:

Q. Doctor Calef, you talked about this Caribou Technical Committee, and we heard

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from Mr. Miller, yesterday, that the committee, in one form or another, has been around for a while.

A. Yes, it has.

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Q. How long have you been a member?

A. Since either the fall of '76 or the fall of '77. I think it was the fall of 1976.

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Q. Are you aware of the activities that this committee engaged in prior to your joining it?

A. Yes, some of them.

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Q. Would it be fair to say that this committee, in its advice to responsible government, before you arrived, had been wrong about the numbers of caribou and whether the populations were increasing or decreasing?

A. I suppose you mean that they made a prediction that the herd would decrease and, subsequently, that was found to be not true?

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Q. Correct.

A. Yes, that has happened.

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Q. And, in fact, I am sure that because of your numerous writings you must have had occasion to refer to Mr. Parker's reevaluation of the evidence with regard to the trends in the population of Barren-Ground Caribou.

A. Yes, I have.

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Q. Would you agree with me--

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turning to page 5-- that it says this:

"Kelsall and Loughery (1955)
surveyed the entire mainland
range in spring 1955."

I take it this is mainland
Northwest Territories.

A. Yes.

Q.

"... and their estimate of
278,900 gave supporting evidence
of the continued decline.
Although this was the last
survey until 1967, some
surveillance continued from
which Kelsall (1960) estimated
that the number had decreased
to 200,000 by the winter of
1957-58. In the absence of
other data these 1955 and 1960
estimates were cited over a
decade in every published
report on Barren-Ground Caribou.
In the mid-1960s, however, came
a growing belief that caribou
were no longer as scarce as
had been thought. Kelsall's
1955 estimates were thought to
be out of date and Retan
(1966) published unsubstantiated

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reports of an uncontrolled population explosion in Canadian Barren-Ground Caribou that would culminate in death by starvation of hundreds of thousands of animals. These unfounded reports brought pressure on the Northwest Territories Game Management Service to relax its restrictions on caribou hunting by white residents.

Lacking facts on the actual status of the caribou populations, the Territorial Government proceeded to liberalize hunting and finally allowed commercial exploitation of the herds in 1968."

Is that what it says there?

A. Yes, you read it correctly.

Q. I take it, from what you said before, that some of the advice that the NWT Game Management Service was getting was from the formerly constituted Caribou Technical Committee.

A. Yes. Well, at that time the Canadian Wildlife Service was responsible for caribou surveys and caribou research in the Northwest Territories, and they were the representatives on the Caribou Technical Committee.

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Q. With regard to these recent documents produced by the committee that you were on--

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A. Yes.

Q. I think you told us that your best recollection was that the subject matter was discussed at the meeting in March.

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A. That's right.

Q. And you said that what was discussed was put into some kind of preliminary version, was edited and you saw the final draft about a week ago.

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A. That's right.

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Q. Do you have a copy of the preliminary version?

A. No, I do not believe so.
Not with me.

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Q. You said that the committee routinely meets once or twice a year. Does it have regular months when it usually meets?

A. No.

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Q. How did this particular-- well, has this committee, in the past, produced these kinds of reports-- three-page summary reports like that, such as we have here?

A. Well, I am sure it has produced summaries of all different lengths and all different subjects over the years. I would think.

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Q. I am asking you

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specifically on this topic-- the topic addressed in these particular reports. Have there been any prior ones that you have been involved with which have culminated in similar reports?

A. No, in the time I have been on the committee-- well, yes, we have produced similar documents. I don't know whether they had exactly the same name or not. But the purpose of this committee is to-- it is two major things. One is to make sure that all biologists who have anything to do with this herd-- from the jurisdictions that have anything to do with this herd-- are kept up to date on what each other are doing and agreed on methods, techniques, et caetera. Number two, to ensure that their findings are summarized and passed on to the more senior administrators in the various jurisdictions. So these summaries here are in the nature of passing information on to the more senior levels.

Q. They are regularly produced?

A. I would say irregularly produced. They should be regular. We try to make them regular, but--

Q. You spoke of computer models and how they were used in arriving at your projections in the decline of the herd.

A. Yes.

Q. You said that basically

GG-12

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you start with the population size in any given year. You know the birth rate. It is just a matter of plugging in the numbers. It is a simple or more sophisticated form than doing hand calculation?

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A. That's correct.

Q. It is true, of course, that the computer will spit out information according to what is programmed in. It does not adjust things on its own.

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A. No, so will a pencil.

Q. Right. I take it that you have done computer runs which feed in variable kinds of data under certain parameters?

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A. Yes.

Q. Is that fair?

A. I haven't done them.

Q. But that has been done?

A. Yes.

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Q. And is it fair to say that any change in certain-- changes in certain of the numbers under important parameters will give you a different result?

A. Certainly. Have to.

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Q. What figure was it that was used by the Caribou Technical Committee for adult mortality?

A. Seven point two percent

per year.

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Q. How does that accord with

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your own findings?

A. Well, that is my own findings. I know where your question is leading. This figure for adult mortality is a figure that is arrived at by difference, and it is arrived at in the following way.

What we have done is we have taken the decline of the herd that has been observed from our calving ground surveys, and we have done a regression in this line-- do you know what that is? -- it is a mathematical procedure for determining what is the best mathematical fit to a set of data.

Q. I have heard it otherwise described as well, but go ahead.

A. But, on the basis-- then we have taken-- using the figures that we have on recruitment and hunter kill-- these are imperically determined figures-- we have estimated what would the mortality have to have been to result in that decline.

Now, here we have used seven point two percent. I think in the paper that you are looking at there we used eight point five percent for natural mortality. The reason is in one case we used a higher estimate of hunter kill. If the hunter kill is higher, then the natural mortality does not have to be as high to result in the same rate of decline. The reason that we used a higher figure for hunter kill in this paper is that after discussion

GG-14

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with people who had more experience in the field in Keewatin we judged that the reported kill figures were probably low, so we elevated them by twenty-five percent. This then required us to bring the estimate of natural mortality down.

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Q. Let me just be more precise about what I was referring to. You wrote a paper with Mr. Heard, "The Decline of the Kaminuriak Caribou Herd."

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A. Right.

Q. And that was in what year?

A. Well, I have written about ten different versions of it.

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Q. Do you have your final version here?

A. I do not.

Q. Let me just ask you in particular about this one statement. I will show you what I am reading here.

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"Thus if the recruitment in the Kaminuriak Herd was 10% this relationship indicates that the natural mortality rate should be 9.9%. A natural mortality rate of 9.9% between 1968 and 1977 would have resulted in a population decline that would have been slightly more severe than the decline that was

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actually observed. Thus, the best estimate of average natural mortality appears to be 8.5% per year."

A. Right. Yes, you read it correctly. And, yes, I wrote that.

Q. Thank you.

A. Do you want to make clear what is meant by the first sentence, "Thus...?"

Q. Well, you are referring to something going back--

A. Yes, that's right.

Q. If you want to tell us, I do not care.

THE COURT: Yes, by all means.

THE WITNESS: Yes, there was a paper published by Tom Bergerud in 1968 on caribou population regulation, in which he put forward what I consider to be the most important single management tool that has been done in caribou research.

What he did was he looked over a very, very broad range of caribou research that has been done over the years from Alaska to Newfoundland, and he tried to establish whether there was a relationship between recruitment in a caribou herd and the best estimates of natural mortality that could be calculated, based on what happened to that herd during the period of this study: whether it was increasing or decreasing.

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He found that there did seem to be quite a tight relationship, which suggested that if recruitment was high, adult mortality was low and vice versa. This relationship seemingly allowed us to-- seemingly allows us or at least gives us some way of estimating natural mortality, which is very difficult to do in the field, by knowing the recruitment rate over a period of years.

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As it turns out, the data that fit the decline of the Kaminuriak Herd comes fairly close to what would be predicted from Doctor Bergerud's model that is based on many, many caribou herds.

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So that gives us an additional confidence.

BY MR. ESTRIN:

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Q. So you were content that gave you confidence in saying eight point five percent when you wrote this paper?

A. Well, yes. Something around that.

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Q. You say 8.5%. You do not say something around that.

A. Yes, that was the best fit of the data, assuming the kill figures that were reported in Keewatin were accurate. They were unadjusted. We took the kill figures exactly as reported and we calculated the required mortality rate to be eight point five percent.

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Q. Well, you now adjusted the

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mortality rate, in effect, is that right?

A. Well, the best way to say it is the other way around: we adjusted the hunter kill figures, and that requires us to then adjust our estimate of natural mortality.

Q. But you are assuming, of course, that in fact that hunter kill rate is accurate to begin with and is changed-- or should be increased in the way you say.

A. That's right. That is an assumption.

Q. And the mortality rate could be influenced by other things?

A. Yes. What we are talking about-- the adult mortality rate is seven point two percent or eight point five percent, depending on which estimate you use. That is in addition to the hunter kill. That is the natural mortality rate: wolves, drowning, starvation-- any sort of accident.

Q. Well-- I will just leave it. I think we can deal with it in argument. You say you have no doubt about the decline-- that the Kaminuriak Herd has been declining. I think those were your words.

A. Yes, I am pretty sure of that.

Q. I want to come back to that. But, before we do, I would like to ask you: what about the Beverly Herd?

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A. My opinion there is that the herd is not increasing. It is either stable or decreasing very slowly. That would be my best estimate.

Q. And that herd has been subject to hunting?

A. Yes, it has.

Q. And in the last ten years?

A. Yes.

Q. And hunting by skidoo?

A. I'm not sure to the extent it is hunted by skidoos. I would assume that the animals now if-- I would assume the animals on the tundra were hunted by skidoos and to a lesser extent in the trees.

Q. You are not certain how the people of Baker Lake hunt the Beverly Herd?

A. No, I'm not certain. I am not certain how they hunt any herd.

Q. You have also written about another herd being hunted in which the population is increasing, is that fair? You have given the NWT Government some statistics in the last year to show that-- that shows other herds in the NWT Barren-Ground Caribou-- or maybe they are not Barren-Ground, but other herds in the last few years are increasing or at least stable and are being hunted?

A. Yes. Every caribou herd

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in the Northwest Territories is being hunted to some extent.

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Q. And some are stable or increasing?

A. That's right. I would like to elaborate on that a little bit, though.

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Q. Yes.
A. What I feel is important is the proportion of the population that is taken by hunting. My feeling is that in the herds that we think are declining, the hunting kill is a much higher percentage of the total population than it is in the herds that are stable or increasing.

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In other words, I would say there is a tendency or a relationship for the most heavily proportionally hunted herds to decline than for the lightest hunted herds to increase.

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Q. What can you tell us about the extent to which the Beverly Herd is being hunted? What proportion of it is being killed off by hunting each year?

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A. I believe it is currently around five or six thousand animals. So, divide that by 125,000, and that is the answer. I do not have my calculator here. I think it is around four to five percent.

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Q. And where do your figures come from?

A. In Saskatchewan they come

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from reports by the Saskatchewan Wildlife Officers or Game Officers; from Manitoba, they come from Manitoba Game Officers; in the Northwest Territories they come from general hunting licence returns made to our Wildlife Officers.

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Q. Have you taken these figures and adjusted them upwards, as you did before, with regard to lowering your mortality rate?

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A. Yes, I think we will probably start doing that routinely now. There may be some differences in the various herds, depending on hunting techniques. This is something that we should know more about is the percentage of animals that are wounded in different herds under different conditions, the number that are not retrieved, et caetera. These are the things that tend to elevate the figures above what is reported.

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Q. Yes. Yes, but I am just asking you whether you in fact adjusted upwards by 25% or more.

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A. Routinely?

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Q. The figures you obtained about kill of the Beverly Herd to arrive at some percentage of kill-- has that been done yet?

A. No, I don't think so. But, whenever we make these adjustments, we usually make a footnote or we make a specific reference in the document saying that it has been done.

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And the figures of reported

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hunter kill exactly as it is reported are available in Yellowknife for anybody who wants to see them.

Q. You didn't bring that data with you. We are missing it for a couple of years at Baker Lake. We tried our best.

A. Well, I will tell you another problem we have is that these returns come in very slowly. First of all, hunters are out on the land for periods of time and so on. They take a long time, sometimes, reporting these, and then the game officer takes a long time in compiling them, and he sends them to Yellowknife and there are problems there. Many of these things are running a year or two behind.

Q. I was thinking of the period 1974-75-- in that area. In any event, I want to ask you about another topic, then. I think, if I understood you correctly, you said the reproductive rate for the Kaminuriak Herd was 69%-- that is for females over one year of age?

A. That is the assumption that we made, yes.

Q. Whose assumption is that? Is that the committee's assumption? Your assumption?

A. Well, it is the committee's in this case.

Q. Can you tell me, if the reproductive rate was higher-- let's say 80%?

A. Of females over one year of age.

IG-22

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Q. Yes. That would have a substantial impact on your population projections in terms of the declines projected by certain dates?

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A. I am not really sure that that would affect our calculation of decline, because what we are using is recruitment. And just because more calves are born does not necessarily mean that

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they will survive through the first year. What we are interested in are the calves that survive, not the ones that are born.

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Q. You do not care how many are born--

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A. Oh, now, I didn't say I didn't care. I said what determines the population dynamics is the number that survive to reproductive age.

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Q. But you won't deny that the numbers that are born have some important role to play in the computation of what the eventual size of the herd is going to be?

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A. Not necessarily. That's what I am saying. It does not necessarily. I mean, obviously, the herd for a period of time has that many more animals because the calves are there. They are born. But, if they die very quickly over the summer or during the first year and do not reach reproductive age, then that does not help the population.

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Q. I appreciate that. But, in your own words, you start with the population size in

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any given year-- you know the birth rate. That is where you start in doing your computer calculations.

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A. Okay. I am not sure-- I am not sure whether we use-- whether we started with births and then estimated calf mortality and ended up with an estimate of recruitment, or whether we just used the observed recruitment rate. I believe we used the observed recruitment rate, which does not necessarily depend on the number of calves-- percentage of calves born.

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Q. Let me ask you, did you disregard the number of calves born? Is that irrelevant?

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A. We try to measure this. We know that it is important in theory. It may not be necessary for calculating the growth rate of the herd if you know the numbers that are being recruited.

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Q. You say the figure that was used, 69%, was one of the figures plugged into the computer calculation.

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A. I believe so, yes.

Q. You agree with that.

A. Yes.

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Q. And in your paper that we have already referred to, "The Decline of the Kaminuriak Herd", you say the following:

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"Because pregnancy rates have consistently been observed to be very high (90%) in all

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females over three..."

A. That is the key.

Q. That is the key.

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A. Right. Two- and three-year-old females have a quite a bit lower fertility rate in the Kaminuriak Herd than three-year-old plus females. So what figure did you read there? Eighty-five percent or ninety percent for three-year plus?

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Q. Yes.

A. Which was it?

Q. Ninety.

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A. Ninety. Ninety percent of the three-year-old-plus animals are pregnant, but if you then add in the two- and three-year-old animals, then the overall figure is lowered to 69%.

Q. Is that a calculation that you did?

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A. It is not a calculation I did. I think it is based on published figures in Mr. Parker's work.

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Q. You were here yesterday when Mr. Miller testified?

A. Yes.

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Q. I thought I heard him say-- and correct me if I am wrong-- if a female caribou lived to over, I think he said, three years of age, it would have a better chance of surviving a given number of years and, accordingly, it would be expected it would then produce a certain number of calves. Is that

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essentially correct?

A. That sounds correct to me.

Q. Would it not, accordingly,

5 be fair to take into account this higher pregnancy rate of females over three years of age of 90%?

A. It is taken into account.

Q. It is?

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10 our report that that is the case, that three-year-old-plus females have 90% pregnancy rate, and that is taken into account in calculating the overall rate for the population of 69%.

Q. That is based on whose work?

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A. Parker.

15 Q. He is still with the Wildlife Services, is he not?

A. Yes, I believe so.

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20 Q. You do a lot of estimations and readjustments in doing these calculations.

A. Which calculations?

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Q. Calculations of total population.

A. Based on calving-ground

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25 surveys?

Q. Yes.

A. Yes, we do.

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30 Q. And I think we heard-- I think it was your evidence that the surveys of 1972, '74 and '78 of Kaminuriak were done on the calving

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ground.

A. I think all of them have been done on the calving ground since 1966.

Q. I think you said the '67 survey was a spring migration.

A. No, that is the Beverly.

Q. So that all of the Kaminuriak have been calving-ground studied since when-- since--

A. Since the Canadian Wildlife Service work began-- what is referred to as the Kaminuriak study. I believe it was 1966.

Q. And that essentially counts-- or estimates-- the number of breeding females on the calving ground?

A. Yes. It estimates.

Q. Why is the word "estimate" a fair one?

A. Because we do not observe the entire calving ground. We observe only a fraction of the area, usually about 25% of the area.

Q. You also estimate-- as I understand it-- the proportion of breeding females in the total population, and you work those two estimates in together?

A. Yes.

Q. Then, as I understand it, from reading your paper, total population estimates thus estimated were increased 25% to account for

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animals that were within your transects or blocks but were not observed.

A. That's right.

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Q. So you plug in another figure-- in this case it is 25%-- to take into account what has not been seen but you expect you should see.

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A. Right. Well, wait. Let me qualify that. It is not what we should see; what we estimate may have been missed because of the difficulties in seeing caribou from the air. It is known from a variety of aerial surveys of big game animals that the observers do not see all the animals, so you have to make some kind of adjustment or you may want to make some kind of adjustment for animals that you fail to observe.

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Q. And in fact your actual counts, you feel, are always underestimates-- and you have to add some.

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A. Yes.

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Q. As I understand it, this correction factor of 25% is based upon tradition, and you quote Parker.

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A. Yes.

Q. But you say

"... but recently, a comparable correction factor (29%) was determined experimentally (Fisher and Duncan 1976)."

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A. Right.

Q. Has anyone else suggested other correction figures?

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A. For caribou?

Q. Yes.

A. I think Tom Bergerud published 25% at some point, although I am not sure.

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Q. You are not aware of any others?

A. No.

I think I should make one thing clear here. Although we are adjusting our surveys for this anticipated percentage of animals that we missed, these are applied uniformly to the surveys. They are not applied for ones where we get a lower number to raise that number and not applied to higher ones, so they are applied to all surveys. Even if this correction factor is not correct, it should be proportionately correct and, therefore, the relative size of the population we are estimating in different years should be some reflection of the trend.

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I do not think we have ever claimed that these surveys are accurate to the animal. We report what we see. We make the judgments that seem reasonable to us uniformly and we try to establish a trend-- a relative change from one year to the next.

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Q. There are other factors that can enter into-- errors that we have not discussed.

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A. Yes.

Q. One of those would be that you had not in fact got the boundaries of the calving area correct.

A. Yes.

Q. And another one could be that the plane might not be flying at a certain altitude that the survey is predicated on.

A. Correct.

Q. Another one could be that the experience of the observer can, in fact, change results.

A. Correct.

Q. You, yourself, have written certain fairly recent studies of the population of the Kaminuriak Herd are subject to fairly significant error.

A. Yes.

Q. I think you have written in the paper the population status of the caribou in the Northwest Territories-- that the last two estimates of 44,000 -- that was yours and Mr. Hawkins, I take it?

A. That's right.

Q. Could be subject to an error of plus or minus 34%?

A. Correct. A sampling error.

Q. And, again, another one by Mr. Heard of 45,000 could be subject to an error of

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plus or minus 23%.

A. Yes.

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Q. I want to refer you to a study published in The Journal of Wildlife Management, 1974, Accuracy and Precision of Aerial Moose Censusing.

A. Yes.

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Q. That is published by certain people of the Alaska Department of Fish and Game.

A. Yes.

Q. Perhaps I might show you the article to see if you have seen it before?

A. Yes, I have.

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Q. This was a study, as I understand it-- this is an empirical study, in one sense. They actually knew the number of moose in this case in a certain area.

A. Yes.

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Q. And they experimented by having planes fly over these areas with persons in them to determine what they counted from the air.

A. That's right.

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Q. As I read the abstract-- the first two sentences:

"Forty-nine observers flew 72 replica counts over four fenced one square mile moose enclosures. Under the most ideal conditions, experienced observers, flying fifteen minutes over each square

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mile..."
in a certain aircraft

"... saw only 68% of the moose
present. Inexperienced observers
saw 43%."

A. Correct.

Q.

"Accuracy of counts was significantly
affected by observers' experience
and currency, by the number of
observers, by snow conditions,
by habitat entering, and by time
of day."

That's what it says?

A. Yes. You left out a couple
of things.

Q. In what I have read?

A. Yes.

Q. Point those out.

A. Well, you didn't read that
there was 2.6 kilometers squared in parentheses.

Q. One square mile. All right.

A. The scientific name of the
moose and so on, but you read the pertinent information.
What is the question?

Q. The question is, would your
studies also be subject to being influenced in their
accuracy by the number of observers, by snow conditions,
by terrain, by time of day?

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A. Yes.

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Q. So in the case of moose,
anyway, we have some higher margin of error than this
25% or 29%.

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A. That's right. That is in
forested areas, which is quite different. We would
anticipate that the error-- the number missed would be
quite a bit higher.

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The other thing, you see, moose
live in lower densities than caribou and what you find
is-- when you do not see anything for a long time--
you kind of lose your sharpness. So that may be a
factor also. But we would assume that moose would have
a higher visibility bias.

I wonder if I could see that
paper again for just a moment?

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Q. Surely.

A. Could I read. Is it proper
for me to read one sentence in this?

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THE COURT: If you feel it is
necessary to clarify your evidence, it is.

THE WITNESS: Yes. I would just
like to read what I think summarizes this whole business.

The last sentence in the
Abstract says:

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"Aerial counts are not considered
valid estimates of absolute moose
number but may be used as trend
indicators in carefully controlled

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situations."

And this is what we are trying to do with the caribou. We are trying to determine population trend.

BY MR. ESTRIN:

Q. Well, that is what it says in the Abstract. Let's refer to what it says in the text. First of all, what do you know about these people that did this?

A. I know one of them is a friend of mine and, the other person, I am aware of his professional reputation. It seems he is a well-respected wildlife biologist.

Q. Would you like to read the second last paragraph in the article starting with the word "Precision...?"

A.
"Precision within the experienced current counter group and within individual counters suggests that use of yearly counts as trend indicators may be valid. However, several precautions must be exercised. Yearly differences in snow cover must be minimized and effort must be made to eliminate differences in lighting, time of day, cloud cover factors. Whether or not migrations coincide

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with snow cover and calendar
date each year must be considered."

Do you want me to keep reading?

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Q. Yes.

A.

"Most important, counts must be
extensive enough to eliminate
the effects of extremes of
accuracy within individuals as
much as 53% difference day to
day and to enter the realm of
statistically valid precision."

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Q. One more paragraph.

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A.

"Such considerations have led us
to manage moose in Alaska less
on the basis of absolute numbers
than by other indicators of
population health and harvest
levels."

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Okay. Now I think I should
maybe elaborate on that. Since you seem to be--

Q. Well, let me ask you.

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MR. CHAMBERS: Well, my Lord,

I am now able to return a favour my learned friends
had refused to afford me a few days ago when in my
examination or cross-examination asked a question
before the witness was finished his answer.

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Would Mr. Estrin please let

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this witness finish his answer.

MR. ESTRIN: Well, I think my question in particular was answered: that is to read those statements. If he wants to say something else, go ahead.

THE WITNESS: If I could see that paper again, please.

THE COURT: If you perceive some conflict between the conclusion of that paper and an inconsistency with the text, you have to put the whole thing in and let the court decide, if there is anything turning on it.

MR. ESTRIN: Well, my Lord, I think we have referred to the text where-- in reference to the abstracted statement. I am content to put in the whole article, if you want.

THE WITNESS:
"Such considerations have led us to manage moose in Alaska less on the basis of absolute numbers than by other indicators of population, health and harvest level."

This is exactly the conclusion that I have arrived at as the Head of Caribou Studies in the Northwest Territories.

The surveys themselves, particularly one or two individual surveys are not sufficient to say that a population has declined. This

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is why I have put qualifiers that you have called attention to-- like Kaminuriak Herd's probable decline and so on. But, in the case of the Kaminuriak Herd, we have three essentially independent lines of evidence that lead to the conclusion that that population is in trouble and is declining.

The three lines of evidence are: one, five surveys that show a decrease-- a trend of decreasing; two--

BY MR. ESTRIN:

Q. Can I have that back?

A. Yes. Evidence on the recruitment and mortality and hunting that suggests that the herd should be declining at a rate that is very similar to what the surveys indicate; three, we have observed over twenty years a reduction in range which in itself on the basis of caribou theory suggests that the herd is declining and that therefore it cannot fully fill the range as it did when it was a larger population.

Any one of those lines of evidence can be challenged in particular points, which you are at great pains to do. But, the three of them taken together and reinforcing each other make, to my mind, a very strong case that this is happening.

Q. Tell me--

THE COURT: Just a moment, Mr. Estrin.

Given the methodology that you

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have just described to me, are your points one and two really independent of each other? Leave the range. I can see that is independent.

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THE WITNESS: Yes, they are semi-independent. You are right in that I have stated the mortality estimate that we use is based on the observed decline. It is estimated by difference.

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However, if we use Bergerud's relationship of recruitment to mortality-- now, recruitment has nothing to do with those calving ground surveys. Recruitment is done in the fall or in the spring, before calving, indicating how many calves have survived through the year. So, if we use Bergerud's

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relationship or if we use the information collected by the Canadian Wildlife Service on estimated mortality caused by wolves and add in a factor for disease, starvation, drowning, et caetera, the

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mortality that we arrive at by those figures is almost identical to the one we arrive at Bergerud's figure and almost identical to the one that we get by the difference calculation.

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This is where this thing starts to get strength. There are many lines of evidence that lead to the same conclusion, and each individual one might be shaky but together they are pretty strong.

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THE COURT: Mr. Estrin.

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BY MR. ESTRIN:

Q. You would be a bit-- let me ask you this again. Wouldn't you be willing to

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reconsider your conclusion if indeed you found that the herd, in fact, in terms of your count was stable or indeed increasing. I am talking about the Kaminuriak.

A. I'm sorry, I don't understand the question.

Q. Certainly one of the things you plug in is your annual population as estimated and, if these figures-- aside from the margin of error of up to 34% or whatever it is-- aside from that margin of error, if indeed there were many more caribou around of the Kaminuriak that had not been counted, of course you would not be in a position to say the herd is declining. Is that not true?

A. Well, yes. But how could there be lots more around that are not counted?

Q. Well, that is what I would like to ask you. What about all these caribou in Wager Bay, Melville, Lorillard Herd. You yourself suggested that it is not perfectly clear where these animals come from-- in your writings. Is that not true?

A. Yes.

Q. Nobody knows for sure; right?

A. That's right.

Q. And people in Baker Lake, for example, who know these animals-- do you know Mr. Barnabus Peryouar?

A. Yes, I have met him.

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Q. He says they taste like
Kaminuriak.

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MR. HEINTZMAN: My Lord, I
don't recall that evidence ever being given?

THE COURT: Well, Mr. Peryouar--
I do believe he said that. That was his evidence that
they taste--

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MR. HEINTZMAN: That Wager Bay
caribou taste like Kaminuriak?

THE COURT: I do not recall him
saying that, frankly.

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THE WITNESS: Well, I think he
is probably right. They all taste the same to me.

MR. ESTRIN: I see. All right.

BY MR. ESTRIN:

Q. You have not hunted with
the people of Baker Lake, I take it?

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A. No.

Q. You were asked by
Mr. Chambers as to whether you would be surprised if
a herd-- and I think he was referring specifically
to the Beverly-- would not cross at a particular
crossing in a given year. I understand that you would
not be surprised.

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A. That's right.

Q. Have you made any studies
of the Beverly Herd yourself?

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A. The only thing I have done
on the Beverly Herd is I did the spring classification

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counts from which recruitment is determined in 1978--
the end of March 1978.

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Q. I take it-- would you be
able to tell us, for example, where the major crossing
sites of the Beverly Herd are?

A. I would be able to tell you
if I looked at the published reports on those-- on
that herd. Yes.

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Q. We have some-- perhaps
not published reports-- but reports that are now in
evidence, assembled from other data.

A. Yes.

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Q. This is the Baker Lake
settlement (?).

A. Right.

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Q. The pink and the grey
indicate certain mining activity or interests. This
sheet shows caribou crossing locations as they come
from certain sources-- Indian and Northern Affairs
and two people in Baker Lake, Barnabus Peryouar and
Hugh Ungungai.

A. Yes.

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Q. Can you tell us, with
reference to the Beverly, whether those crossings
accord with your knowledge?

A. As I said, I do not have
personal knowledge of Thelon River crossings by the
Beverly Herd. Anything that I would know would be
based on the studies of Canadian Wildlife Service,

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IDS, Northwest Territories Wildlife Service and so on.

Q. You see there are a certain number of major crossings agreed to by the Department of Indian and Northern Affairs?

A. Yes.

Q. I would like you to assume for a moment, that caribou have not crossed at the vicinity of Schultz Lake in the last ten years.

A. They have not crossed-- going north or south?

Q. Well, my understanding would be that they have not crossed. Which way would they be going?

THE COURT: Perhaps you'd better identify your exhibit number.

MR. ESTRIN: Yes, my Lord. I am referring to Exhibit P-9.

THE WITNESS: Well, I can't say. If I had to guess, I would say they would be going from north to south. But I'm not sure.

BY MR. ESTRIN:

Q. Are you aware of whether crossings in this area are normal or not to the migratory route of the Beverly Herd?

A. No, I am not aware.

Q. All right. That is all I have to ask about that. You were asked about your opinion about the response of caribou to certain activities and particularly to aircraft overflights and,

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of course, you yourself have written on this topic?

A. Yes, I have.

Q. And you were in accord yesterday and heard us refer to Mr. Miller and Anne Gunn's latest paper?

A. Yes, I did.

Q. Would you agree the work represented in here is the most extensive study of the response of caribou in Canada to helicopter harassment?

A. Yes.

Q. Have you ever made a study solely in regard to the effect of aircraft overflight on the caribou?

A. Not solely, no.

Q. In fact, the study you did-- or the writing you did on this topic was made incidental to another activity?

A. The study that we did was done-- yes-- done in conjunction with a study that was primarily to determine population and distribution.

Q. Have you done any work with regard to the physiological reaction of caribou to harassment?

A. No.

Q. Mr. Miller indicates in his work that aside from overt behavioural responses of caribou, other potential effects of harassment can occur then that certain of these would only become apparent months or even years after harassment.

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A. I think that's correct.

Q. Would you be in a position
to agree with that?

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A. Yes.

Q. And near the conclusion of
his study, he said as follows:

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"We do not know the long-term effects
of harassment on individuals.

Although the energy costs of
responses to harassment may appear
low, any extra drain of energy
over a relatively long period
could seriously deplete the

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reserves essential for successful
reproduction and survival. At
best we have only a limited
understanding of the role of

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adversive conditioning or
habituation in determining changes
in response levels over prolonged
exposure to harassing stimuli."

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Do you agree?

A. That is true in theory, yes.

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Q. And I take it, not having done
the work, you would have to agree with the theory?

A. Oh I agree with the theory,
even if I had done the work. That is in theory true.
That's right. To measure the extent to which that
would occur, one would have to do studies.

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Q. And it goes on to say:
"Sufficient accumulation of affected individuals will lead to impacts at the level of the population over the long term. Although we know that high reproductive success over the long term for both species is, at best, sporadic, we do not have a good measure of an additional slight loss of reproductive effort and/or a slight increase in mortality. But we can judge with confidence that such changes would be detrimental and most likely adversely influence sustainment of the population. We do not understand the degree of affinity to traditional ranges and migratory routes by the animals, nor the levels of harassment that might force the animals to abandon ranges and/or routes or the total consequences of such abandonments. We can, however, predict that it is probable that almost any interference with the distributions of the animals by foreign activities that drive them from their preferred ranges or cut-off migratory routes will have a marked effect on the

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segment of the population concerned."

Would those statements concur
with what you understand?

5 A. Well, that was quite a long
bit and you read it very fast.

Q. I will be happy to let you
read it.

10 A. Sure. I think there are
some statements in there that I would either qualify
or not agree with in some cases.

When he talks about the sporadic
high output, for example-- the reproductive output--
he is speaking about Peary Caribou, which have been
15 shown to be quite different from Barren-Ground Caribou
in that weather and consequent availability or
unavailability of food to Peary Caribou populations
has been suggested as the regulating factor there and
often these things are density independent and,
20 therefore, I would not agree with the conclusion that
a small overall decrease in the reproductive activity
of a Peary Caribou population would necessarily result
in a long-term decrease in the population.

25 Similarly, I would not
necessarily agree that if animals were driven off
certain parts of their range that would necessarily
result in a population decline if range were not the
limiting factor to the population which is again, I
think, a pretty strong argument in caribou that range
30 is not the limiting factor.

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I think there was a statement in there something to the effect that certain ranges seem to be critical to caribou, and that I would agree with. And if they were driven from those ranges, one could anticipate or at least be concerned about a decline in the population.

Does that answer your question?

10

Q. Yes, I think it does. You mentioned certain herds-- what did you tell us about the Bathurst Herd?

A. In what regard?

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Q. You mentioned it. I am sorry, my notes are not exactly clear. It came after your reference to how in Alaska it has been found that the cow and calf caribou avoid the pipeline haul route during spring and summer. You said that was an avoidance of part of the range, but then I think you went on to say the Bathurst Herd-- I think you said some mining activity and nothing happening there.

20

A. Well, okay. I hope I didn't say "nothing" because that would indicate that we have a greater ability to detect these things than perhaps we do.

25

But, our understanding is that the Bathurst Herd is still maintaining itself at about 150,000 animals, and that the ranges within the variation that we anticipate seem to be pretty much the same in the areas of mining. And we see a great deal of caribou movement right through mining camps,

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abandoned mines and so on.

Q. First of all, let me ask you what is the extensive mining activity that you are talking about?

A. I am not sure whether I used that word. I detest the word "extensive", and I try not to use it. I just said that there is mining activity on the Bathurst Herd range. I don't know whether it is more or less than on the Kaminuriak or anywhere else. But I know that there is claim staking, diamond drilling, abandoned mines, fuel drums, aircraft operating, field magnetic surveys-- what else is there.

Q. I don't know. You tell us.

A. Anyway, it is there. That stuff is going on there.

Q. And over what geographic area?

A. Most of it.

Q. Bathurst Island.

A. No, I am sorry. I am talking about the range of the Bathurst Caribou Herd, which is on the mainland, from approximately Yellowknife to the Arctic Ocean near the Queen Maud Gulf and as far west as Coppermine, the eastern end of Great Bear Lake and so on. It is a huge area. It is about 200,000 square miles. There is mining activity going on almost throughout the area.

Q. And are you able to compare

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the extent of mining exploration activity in the Baker Lake area?

A. No.

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Q. You do not have any specific knowledge?

A. In terms of aircraft hours per square mile, or something like that?

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Q. Yes.

A. No, I am not.

Q. All right. Is it not the case that in fact you have written that this Bathurst Herd is stable or slightly decreasing?

A. Yes.

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Q. And it is in a report to the Government of the Northwest Territories?

A. Yes. My best guess is that it is stable.

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Q. Your best guess. But you are not too sure about it.

A. That's for sure. I am not certain about it. That's right. It is certainly not increasing, let's put it that way.

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Q. And the percentage of the kill-- or the kill as a percentage of the population there is what-- substantially lower. Four point six percent as compared to seven point three percent.

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A. Yes. However, in recent years-- and those are the years in which we suspect the decline may have started, the kill is quite a bit

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higher than it has been previously and we have a good deal of reason to suspect that kill is very much under-represented.

5 Q. You have put these figures that I am referring to in a report made on the current status of caribou herds, tabled January 19th, 1979, to the Government of the Northwest Territories, and you have not indicated there that the four point six figure should in any way be qualified for the Bathurst Herd.

A. May I see that table, please?

Q. Certainly.

10 A. Okay. You see, the figures I have presented here only go up to the winter of 1975-76, and this shows you the difficulty that we are up against in collecting these kill statistics. This says to me that figures beyond those dates were not available to me at the time, or I would have used them.

15 Q. Doctor, were you not in court yesterday when I read from-- and Mr. Miller agreed that I was reading from the 1977-78 statistics of kills for Baker Lake, the Government of the Norhtwest Territories figures?

20 A. Perhaps you're right. These things don't come in all at the same time.

MR. CHAMBERS: My Lord--

25 THE WITNESS: All I am saying there is the figures I used there were up to 1976.

BY MR. ESTRIN:

30 Q. Where does it say that,

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Doctor Calef?

A. Down at the footnote at the bottom of the table.

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Q. It does, does it?

A. I think so. I hope I am not seeing things.

Q. You qualified that for certain years.

10

A. Okay. Here is the column entitled Kill. There is a footnote (a). (a) says "Average of three years, 1973-74 to 1975-76."

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Q. I see. Your other footnotes are in the other columns on the percentages.

A. Yes.

Q. You are saying this is the average of three years in terms--

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A. Those three years.

Q. In terms of the population or of the kill?

A. Well, both.

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Q. Well, how can you determine what the actual kill as a percentage of the population is? Are you taking it only in those three years?

A. I am taking the kill in those three years, and I am dividing it by this population.

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Q. Which was a 1978 population?

A. That's right.

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Q. So you used 1978 population but divided it into kill from earlier years.

A. That's right.

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Q. You could have obtained, I suggest, the more recent kill statistics.

A. Well, I don't know. I think that had I been able to, I would have. I am not sure.

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THE COURT: You are moving into another area, Mr. Estrin, and unless you are almost finished, I think we should break for lunch.

--- luncheon adjournment

--- upon resuming

--- GEORGE WALLER CALEF, recalled

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CROSS-EXAMINATION CONTINUED

BY MR. ESTRIN:

Q. Doctor Calef, you will recall at some point this morning we had a brief discussion about the caribou north and east of Baker Lake, and I have some statistics in front of me that say that in 1976 there was found to be 29,000 animals in a Wager Bay-Lorillard Herd. I believe that was a report that you brought together. That figure was contained in a report that you brought together.

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A. Yes, I was one of the authors of that report.

Q. And that was the population statistics for 1976, and I think your note was that it was increasing.

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A. Yes, that was a very

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tenuous statement. I realized when I made it. There is really no basis in terms of a series of surveys for that herd that would allow me to make that judgment.

5 Q. Doctor Banfield seems to agree with you; at least what you said back then. He says at paragraph fourteen

"Recent evidence suggests that a small part of the Kaminuriak Herd may have joined the Wager Bay Caribou Herd and wintered north of Chesterfield Inlet rather than migrating south. The Wager Bay Herd has increased since 1976."

15 A. Who said that?

Q. Doctor Banfield, in a sworn statement.

MR. GRAHAM: It is not in evidence yet.

20 MR. ESTRIN: I didn't say that. It is a sworn statement.

BY MR. ESTRIN:

Q. Do you have any reason to disagree with that?

25 A. May I see that statement?

THE COURT: You may find that Doctor Banfield was depending on this witness' report. I don't know.

30 MR. GRAHAM: Doctor Banfield may not be called at this point.

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MR. ESTRIN: Well, that really is neither here nor there, is it?

THE WITNESS: Okay. To my knowledge there is no evidence that members of the Kaminuriak Herd have joined the Wager Bay Caribou Herd. There is evidence that Kaminuriak Caribou did winter north of Chesterfield Inlet in some winters rather than migrating south; however, they did migrate south to the Kaminuriak calving ground in the spring. So they would still be considered part of the Kaminuriak Herd.

The third part of the statement:
"The Wager Bay Herd has increased since 1976."

I am aware of no information that would allow that conclusion.

BY MR. ESTRIN:

Q. Well, just taking it that some portion of the Kaminuriak Herd has wintered north of Baker Lake.

A. Yes.

Q. Would that be a change in the winter range for that period?

A. It would be a change in the sense that it was not reported during the years when the studies by the Canadian Wildlife Service were done. They did not observe animals that they considered part of the Kaminuriak Herd go north of Chesterfield Inlet.

Q. So for that period of time it was a change in winter range.

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A. Well, I say again, it had not been observed, to my knowledge-- it had not been published in the scientific literature that I am aware of that Kaminuriak Caribou wintered north of Chesterfield Inlet. It has been observed-- I think on two occasions in the last couple of years-- last few years.

10

Q. You yourself, in writings you have done recently, said that the 25,000 or so caribou in the Wager Bay-Lorillard aggregation, whatever that may be called, appear to be distinct from the Kaminuriak.

15

A. Yes. Well, they are distinct by our definition of calving in a separate area from the Kaminuriak Herd, yes.

20

Q. I am referring to your paper written with Mr. Heard, Cooper, for the Fish and Wildlife Service, N.W.T., 1977, entitled Number, Distribution and Productivity of Caribou in Northeastern Keewatin District, Northwest Territories.

25

A. Yes.
Q. That is a paper you co-authored?

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A. Yes, it is.
Q. You say that these-- I will just read what you say:

"The approximately 25,000 caribou estimated to range on the two study areas described herein..."

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which I take it was Melville--

A. No.

Q. What?

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A. It would be north and south of Wager Bay. From Chesterfield Inlet to Wager Bay, to north of Wager Bay.

Q. Those two areas--

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"... substantially increased the number known to exist in Northeastern Keewatin..." --

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A. "Known to exist", that is the key to it. You see, there were not any surveys done prior to that work.

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Q. To your work.

A. That's right.

Q. And your work was done when?

A. I believe that is spring of

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1976.

Q. And you say:

"The two caribou groups described here appear to be distinct herds in that they calve on separate and distinct calving areas."

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You are talking about the two distinct herds being which ones?

A. Well, the one that calves

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north of Wager Bay-- in this area (indicating) and the one that calves south of Wager Bay around the Lorillard River.

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Mr. Heard chose to name them the Wager Bay Herd, which is the northern one, and the Lorillard Herd, which is the southern one.

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As I said before, the Beverly Herd, for example, has a northern and southern calving ground, so maybe it is all one herd. I tend myself to refer to it as the Wager Bay Herd and assume that perhaps there is some mixing.

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Q. And that would be distinct from the Melville Herd?

A. Yes, it would.

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Q. And the Melville Herd is to the north?

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A. Yes, it is on Melville Peninsula, and those animals calve north of Lyon Inlet and on the Owl River and Barrel River area.

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Q. Your statement goes on that these herds-- which I take it are the two caribou herds described here: Wager Bay and what is the other?

A. I am not sure.

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Q. Okay. I just want to be clear.

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"The two caribou groups described here appear to be distinct herds."

A. That is the caribou groups north and south of Wager Bay.

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Q. Which you called jointly the Wager Bay Herd. The two groups you are calling Wager Bay appear to be distinct from the Melville Herd

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to the north?

A. That's right.

Q. And from the Kaminuriak Herd

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to the south.

A. Yes.

Q. And after you make that

statement, particularly with reference to the Kaminuriak
Herd to the south, you say Parker 1972?

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A. Yes.

Q. And Calef and Hawkins 1977.

A. Right.

Q. And, obviously, "Calef and
Hawkins" that is your own work. Yours and Mr. Hawkins.

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A. That's right.

Q. The other reference you give
to say that they are distinct is a reference to
Mr. Parker in 1972?

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A. Yes.

Q. Is that study I referred you
to before-- G.R. Parker, Biology of the Kaminuriak
Population of Barren-Ground Caribou, Part I, Canadian
Service Wildlife Report No. 20.

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A. Yes, it is.

Q. Was there anything in
particular in this report that you were thinking of
that Mr. Parker said which allowed you to cite him as
the authority that this herd would be separate?

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A. What I meant was that he

has shown where the Kaminuriak Herd has calved over a

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period of years during his study, and that area is distinct from the area in which we saw them calving.

Now, there were studies done--

I was on Melville Peninsula in June of 1976. Heard and Cooper were around Wager Bay in June of 1976, and Hawkins was on the Kaminuriak calving ground in 1976. There were caribou on all three of those calving grounds. Obviously they were different groups of caribou. You know, there is no way that caribou could have gone from Kaminuriak to Melville Peninsula in that period of time.

What I am saying is we have three simultaneous surveys on calving grounds and if you look at the numbers on those three reports, you can tell how many caribou were on each of those areas at that time.

Q. Yes, but, Doctor, you have recognized that no one has reported about caribou in the Wager Bay area prior to 1976--

A. No--

Q. What evidence do we have prior to 1976 of caribou calving in that area that you found are not part of the Kaminuriak Herd--

A. Okay.

Q. Didn't come from the Kaminuriak?

A. You have made two points. The first one is wrong. It is not true that no one has reported caribou in the Wager Bay area. There

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have been hundreds of reports, you know, there was a Wager Bay post there that I dare say contains records of caribou. The explorers have gone to Wager Bay.

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Inuit hunters know that there are caribou around Wager Bay. We knew they were there. We just had not enumerated them with proper surveys prior to 1976.

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Your second statement, do I know that those caribou that were around Wager Bay in the spring of 1976 did not come from the Kaminuriak Herd. You are correct. I don't know for sure, but I have no evidence that they did.

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Q. You have no evidence that they don't.

A. That's right.

Q. In fact, you go on to say in this paper, and I am quoting you:

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"It is possible that some of the caribou in the Lorillard Herd are immigrants from the Kaminuriak Herd."

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A. That is a possibility but, subsequently, in working out population dynamics of the Kaminuriak Herd, as I said previously, I now have confidence that we can explain these changes in the Kaminuriak Herd just in terms of births and deaths and we do not have to invoke emigration.

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Q. In the same paper, in fact the sentence before the one I just read-- two sentences. I will read you the last paragraph of your

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paper.

"It is impossible to say whether more or fewer caribou have previously inhabited the area described here since no previous surveys had been done in these areas."

A. That's right.

Q. You have already said that

"It is interesting to note, however, that in recent years the Kaminuriak Herd has probably declined by approximately 20,000 animals..."

citing yourself and Hawkins. The first statement is that it has probably declined. Right? You said that.

A. Yes, I am a very careful fellow.

Q. I noticed. And you go on:

"It is possible that some of the caribou in the Lorillard Herd are emigrants from the Kaminuriak."

A. Yes, it is possible.

Q. You have also-- there has been quite a variation, has there not, in the observations of the size of this Wager Bay-Lorillard Herd over the last few years?

A. Well, I am not sure what you mean by observations. There have only been two

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sets of surveys that have been done, as far as I know, by what one might call scientific survey methods, and there has been some difference in the number of caribou between those two surveys. But certainly one cannot say-- just to give you an example: many times I have flown at five hundred feet above the ground from Baker Lake to the Hudson Bay coast at Wager Bay and never seen a single caribou. They are very difficult to see in the summer, and they move, and I would say that, you know, somebody going into an area and flying around a little bit or having a camp in a certain area not seeing caribou does not mean that at some time there would not be caribou on those ranges.

In other words, you know, there is a lot of sort of hearsay evidence about the number of caribou north of Chesterfield Inlet-- between Chesterfield Inlet and Wager Bay, and I am saying you have to interpret those statements of people who have seen only a small part of the range for a small part of the year with a lot of caution.

Q. So your best view would be that the Wager Bay-Lorillard Herd that you reported on in 1976 as being 29,000 increasing is a fair estimate today?

A. It is the only one, I think.

Well, I guess Judy Donaldson did one in 1977 that found a smaller number of animals in the Wager Bay area.

Q. Would you assume with me for

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a moment that 29,000 animals or a substantial portion thereof that you found in the Wager Bay-Lorillard Bay groups came from the Kaminuriak. Let me just ask you to assume that for a moment.

A. Okay.

Q. That would not be inconsistent with population shifts to new ranges; in fact, this Kaminuriak Herd has already-- had occurred in the last few years.

A. I'm sorry. I missed-- "the last few years"?

Q. It would not be inconsistent with a change in range-- the winter range of the Kaminuriak that you yourself have told us about?

A. No, it would not be inconsistent. It would be a change in range, in effect. But, the answer to that is that if that were the case-- if one assumes that-- then one has to assume that all of the other estimates that we have made of the Kaminuriak Herd are erroneous or that some of them are erroneous: either the population estimate or the recruitment estimate or the hunter kill or the natural mortality or some combination of those have been consistently wrong for a period of years, and that the trend that we observed, based on population dynamics, is spurious-- also, not only is it spurious but also, coincidentally, just the number of caribou that moved to Wager Bay.

Q. Yes, it would be quite a

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coincidence. The numbers seem to fit very nicely,
don't they?

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THE COURT: You have to say yes
or no. We cannot record a nod.

THE WITNESS: Yes, if 20,000
animals were lost from the Kaminuriak Herd and 20,000
were added to the Lorillard Herd, yes, that would be
a coincidence.

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BY MR. ESTRIN:

Q. And population shifts to
even new calving ground, they may be infrequent but
they are far from unprecedented; is that true?

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A. There is a small bit of
evidence from a couple of herds in Alaska and Canada
that occasionally a big part of one herd will break off
from the normal migration of that herd and go to the
calving grounds of another herd, and they may not come
back. This was hypothesized for the Porcupine Herd
and I think for the Bathurst and Beverly Herd-- the
Porcupine Forty Mile Herd-- some animals from the
Forty Mile Herd went to the Porcupine Herd and some
animals-- I guess it was the Beverly Herd went to the
Bathurst Herd.

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But, let me just say that all
of these possibilities are equivocal. The only
unequivocal evidence would be marked animals turning
up somewhere. You know, trails can go off in one
direction and it looks like the animals are going to
go that way, and they may turn around and go back

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somewhere else. This is the problem. You can go along speculating all you want, but the answer is we don't know about these things. They are possibilities.

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Q. You know Judith Donaldson?

A. Yes, I do.

Q. Who is she?

A. She is a woman who was a

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wildlife biologist for the Northwest Territories in 1977, and she is now an environmental consultant who does some work for us as well as for other groups. She has a Master's degree in-- I think it is zoology from the University of British Columbia.

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Q. And you are aware that she wrote a paper, "Estimation of Numbers and Recruitment of the Wager and Lorillard Caribou Herds in Keewatin" in 1977?

A. Yes, I am.

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Q. That was published under the name of the N.W.T. Fish and Wildlife Service, February 1978?

A. Yes.

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Q. I want to refer you to what she has to say, then, on page 13. She says:

"Although population shifts to new calving grounds are infrequent, they are far from unprecedented. Skoog (1968) and Kelsall (1968) have each documented several cases in which

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groups of caribou as large as
25,000 and 30,000 calved up to
550 miles from their previous
year's calving ground."

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Do you disagree with what she
is saying there?

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A. I disagree with the use of
the word I think it is "documented". Those are the
two cases I was talking about. Skoog was talking about
a shift of Forty Mile animals to the Porcupine Herd
and Kelsall was talking about something having to do
with Beverly and Bathurst, I believe. I do not think
those people documented the movement of those animals

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because I think that it is almost impossible to make
that documentation without marked animals.
You know, trails can head off
in one direction-- as I said before-- and it may
lead you to an erroneous conclusion. I think they're
right, but it is not absolutely certain. I am willing
to accept that these changes can occur on occasion.

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Q. Well, you said that it is
theoretical that it can occur. I am asking if you
disagree that they have in fact happened in these two
cases.

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A. Okay. That's what I am
trying to say. I think the evidence is not as strong
as it is for, say, some other points in caribou
biology. There is strong inference that this happened,
but I do not think the data is completely unequivocal.

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Q. Well, just to clarify this.
Mr. Skoog wrote, in 1968-- it was an unpublished
Ph.D. thesis, University of California--

A. Yes, I have read-- I know
exactly what you are talking about.

Q. It is 699 pages, and
Mr. Kelsall, I take it, was writing about something
different-- a different--

A. Herd.

Q. A different herd. And his
work, I take it, is published, "Migratory Barren-Ground
Caribou, Canada, Queen's Printer, Ottawa".

A. Right.

Q. I gather that the N.W.T.
Fish and Game people are very concerned about the
Kaminuriak Herd, and it is your position, of course,
it is being overhunted by native people.

A. No, I don't use that word.

Q. I see.

A. At least I hope I don't.

I try not to.

Q. Overharvested?

A. No, I don't use the word
harvested, if I can help it. I do not like that word
either.

My position is kind of stated
the other way around: I am saying the current
population level, current environmental conditions
that are prevailing there, the hunting which does occur

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is part of the mortality that results in the herd declining. What we are saying is the total mortality is more than that herd can support.

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Now, I don't choose to call that overhunting. It is part of the total mortality which is resulting in that population declining.

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Q. All right. In any event, you would not disagree with the suggestion that there ought to be less hunting of the Kaminuriak Herd?

A. If that herd is to increase, it is my opinion that that can occur only if hunting is reduced.

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Q. Only. That is what I wanted to ask you about. That was certainly the major management option put forward-- that exhibit we had introduced from your committee yesterday. What I would like to ask you about is another management option that I did not see considered, and that is what about assisting the people of Baker Lake to hunt the Beverly Herd? Has that ever been offered by your department?

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A. I don't know whether it has ever been offered formally. It has been discussed on occasion.

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Q. No formal offer? No discussions about how you would do it and how it would happen-- with the Hamlet-- with the hunters and trappers.

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A. No, that has not happened, to my knowledge. I have not participated in

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discussions like that.

Q. And while we are talking about various people that are interested in these areas, let me ask you: my information is that there is a great deal of interest by mining companies in being able to obtain access to the Thelon Game Sanctuary for exploration activity. Is that your information?

A. Yes, I have that feeling.

Q. What position has your department taken on that?

MR. CHAMBERS: My Lord, I must object at this point. This is surely--

THE COURT: The Territorial Government is not on trial here in any respect.

MR. ESTRIN: I quite agree, my Lord.

BY MR. ESTRIN:

Q. Has your department offered any advice to the Government of Canada as to whether or not native people-- I am thinking particularly of the people of Baker Lake-- should be allowed access to the Thelon because of their complaint that they cannot get enough caribou around Baker Lake?

MR. CHAMBERS: My Lord, what relevance is the Thelon area. The Thelon area has never, throughout this trial, been identified as a hunting area. In fact, whatever there is indicates -- on the part of the Plaintiffs themselves-- they stayed

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out of the reserve and do not hunt there. They respect the law. What relevance has any question directed to that area.

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I must respectfully object to this question.

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MR. ESTRIN: My Lord, I think my clients perhaps did not have the benefit of legal advice back in 1922 when the Thelon Game Sanctuary was created. They are respectful of authority, no doubt, until, of course, they are very pressed, and then they begin to question whether the authority is legal. That is why we are here.

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It may very well be that one of the reasons my clients have not hunted in the Thelon is because it is to be protected and they respected that up to this point in time.

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And that may be that there is no evidence before this Court as to hunting in the Thelon. That is not--

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THE COURT: There is no evidence of mining activity in the Thelon either.

MR. ESTRIN: Well, I was just asking the witness whether it was being urged that it be opened.

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THE COURT: Well, when you get to the Mackenzie River will you stop.

Honestly, Mr. Estrin, we are talking about Baker Lake and area. The Thelon is a good, long snowmobile ride from Baker Lake.

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MR. ESTRIN: That is true, my Lord, but that also happens to be where the Beverly Herd Caribou have gone in the last year, isn't that true, Mr. Calef?

THE WITNESS: In the summer?

MR. ESTRIN: Yes.

THE WITNESS: Yes, that is my information.

BY MR. ESTRIN:

Q. And has any thought then been given to allowing native people to hunt the Beverly Herd in the Thelon Sanctuary?

A. I don't know.

THE COURT: Who administers the Thelon Sanctuary? The Territorial Government or Federal Government?

THE WITNESS: I really have very little knowledge-- personal knowledge-- about it. I don't know. I have not participated in any discussions about that.

BY MR. ESTRIN:

Q. Just one last point. You said, as I recall your evidence--

If I may have a moment.

You were asked, I think by Mr. Graham, about the reaction of caribou to different kinds of stationary objects.

A. Yes.

Q. And I think you said that you

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have seen or there are reports in the literature of thousands of caribou swarming around villages.

A. Well, I think that "swarming" thing came from this paper here. I wouldn't really use that word, I don't think.

Q. No.

A. I think there are reports in the literature that I could find-- I cannot put my finger on them right now-- of caribou migrations going through communities like Uranium City, Fond-du-lac-- places like this. I seem to recall-- I can't think from where-- that caribou have come very, very close to Eskimo Point. And I have personally seen small numbers of caribou go through or very close to Old Crow. I have seen caribou and caribou trails all around the community of Arctic Village in Alaska. And one other place. Oh, and Coppermine. I have seen caribou right on the runway and, you know, within shooting distance of Coppermine.

Q. Well, let me ask you-- have you seen thousands of caribou swarming around Baker Lake in the last ten years?

A. No.

MR. ESTRIN: Thank you. Those are my questions.

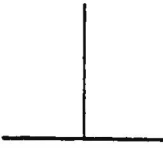
THE COURT: Mr. Chambers?

RE EXAMINATION

BY MR. CHAMBERS:

Q. Doctor Calef, I have a few

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questions. When you discussed this matter of the possibility of the split up of part of the Kaminuriak Herd joining what you call, loosely, the Wager Bay Herd, you said that the decline in the Kaminuriak Herd can be explained without taking into account any possible emigration on the part of the herd. Could you elaborate on what you had in mind by saying this?

A. I thought I had done this ad nauseum.

I am just saying that we have information on reported hunter kill which we accept with some adjustment. With or without, the trend is the same.

We have several measures of natural mortality-- this is mortality other than hunting: wolves, drowning, accidents and so on. Then we have estimates of the recruitment, that is the number of caribou surviving their first year of life who enter the adult stage of the herd.

These three figures allow you to predict the net change in numbers, and the change in numbers that is predicted by the information that we have predicts a decline that is very similar to what has been observed from the aerial surveys and this leads us to believe that that is-- that is all that is required to explain the decline that we have observed in the surveys.

Now, if the numbers of caribou were leaving the Kaminuriak range also, then this means

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that either the herd should decline faster than we have observed or else the herd must be more productive or less subject to mortality than we have observed. So I think there are more assumptions required in the second case than in the first case. It requires fewer assumption to assume the animals have not left the herd than have. That is the way science works. I mean the caribou may have flown to the moon, may have turned into rocks-- you know, everything is possible unless you take the philosophy that you use the simplest assumptions.

Q. In the light of this, what degree of probability, if any, would you ascribe to a portion of the Kaminuriak Herd having split off and become the Wager Bay Herd or joined it?

A. I think it is unlikely that large numbers have gone there.

Q. You were asked about the discrepancy between the natural mortality rate of 7.2%, which was estimated and agreed upon by the Caribou Technical Committee-- on page 2, the first full paragraph under management options.

A. Yes.

Q. And, of course, it is the figure Mr. Miller testified to yesterday. You were asked about the figure of 8.5%. Do you recall that? And that you also said, if I remember correctly, that this was your figure, based upon only actual reported kill figures.

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A. That's right.

Q. How are these natural mortality figures arrived at?

A. Well, I thought I explained that.

Q. Perhaps briefly again, so we take up the trend.

A. They are arrived at by taking the best fit of the-- for the decline-- from the observed survey data, and using the estimates for hunter kill, recruitment-- yes, hunter kill and recruitment, what is the mortality rate that is required to allow the observed decline to have taken place. And these figures are supported in rough ways by other sources of information which is data based on other caribou herds and data based on estimates of natural mortality from the field: for example, wolf predation and accidents from other herds.

Q. On the basis of the 7.2% figure, stated in Exhibit P-10, it said no more than 2.8% of the herd can be harvested without further decline of the herd. On the basis of the 8.5 percentage figure, what would be the percentage of the herd that could be harvested without further decline of the herd?

A. I believe it is 1.5%.

Q. What is the actual observed kill rate?

A. It depends on whether you use

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the adjusted or unadjusted kill rate.

Q. Let's take both.

A. And it depends on which year span you want to take the average hunter kill over. It has been higher in recent years. And then it depends on what population level you divide. But it is approximately ten-- eight to ten percent of the herd, currently. Say 4,000 animals in a herd of 40,000 would be 10%. It is in that ballpark-- between 7 and 11%.

Q. You were asked about the western edge or periphery of the range of the Kaminuriak Herd.

A. Yes.

Q. And you were referred to-- in connection with the study of Mr. Parker. Is this Doctor Parker or Mr. Parker?

A. I think it is Mr. Parker.

Q. Mr. Parker. And it was drawn to your attention that at pages 32 and 34 and Figure 9 on page 34 which show caribou activity on the east side of the Kazan River.

A. Yes.

Q. And turning to page 14, there is another map there. It is called Figure 1.

A. Yes.

Q. Could you read the description of Figure 1?

A. It says:

"The maximum range of the Kaminuriak

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caribou population from May 1966
to October 1968."

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Q. And could you describe what
the western periphery or the western edge of this
range is, according to Figure 1?

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A. Well, the very northwestern
-- the northwestern corner is formed by Chesterfield
Inlet, Baker Lake, Kazan River, Thirty Mile Lake,
Ferguson Lake down to Yathkyed Lake.

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Q. Can you just describe,
further down, what the range was? For what year?

A. May 1966 to October 1968.

Q. Yes.

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A. Well, then it goes through
the middle of Yathkyed Lake to Angikuni Lake, then it
crosses the Kazan River north of Ennadai Lake down to
Holdia Lake, Selwyn, the headwaters of the Porcupine
River and it just touches the northern corner of
Wollaston Lake, and then south to Reindeer Lake.

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Q. Is this still in the
Northwest Territories?

A. No, it is not. Everything
since Selwyn Lake has been Saskatchewan. Reindeer
Lake is on the Saskatchewan/Manitoba border. And then
the boundary goes almost straight east-west across
Southern Indian Lake, Northern Indian Lake into the
Churchill River and then down the Churchill River to
the coast. The coast is the eastern boundary.

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Q. And what is the northerly

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edge according to this Figure?

A. Baker Lake, Chesterfield Inlet.

Q. Is there anything north of Chesterfield Inlet?

A. There is not.

Q. Now, questions were put to you relating to an alleged increase in caribou populations as a result of which Northwest Territories Government, if I understood it correctly, allowed larger hunting. Do you recall that?

A. There was a statement read from-- I believe it was Gerald Parker's paper relating to Retan or stating that Retan had published unsubstantiated reports of caribou increases which, in turn, led to liberalized hunting laws.

Q. Aside from Mr. Retan, did anyone else hold these views-- that there was an increase in caribou?

A. Well, I don't know whether they held those views. I don't know whether anyone wrote articles or publications that would have made that type of statement.

Q. You were asked questions about long-term effects of harassment and this may not be evident until much later after the harassment has taken place.

A. Yes.

Q. And you were referred to

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Mr. Miller's study in this regard and you replied-- my note says-- this is in theory only. Do you recall that?

5 A. Well, I think Mr. Miller's remarks were saying that this is the theory; that if you had delayed effects-- that there are effects, possible effects, of aircraft harassment that could be undetectable for a period of time. And I agree that
10 in theory that is possible.

Q. Sir, is there any evidence of long-term effects of any harassment of caribou in the Baker Lake area, particularly, if I may draw your attention to the Kaminuriak Herd?

15 A. Well, I know of none that I can attribute or that biologists have attributed to aircraft harassment.

MR. CHAMBERS: May I just have a minute, my Lord.

20 Those are all my questions.
Thank you.

My Lord, this is the case for all the Defendants except the mining companies.

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MR. GOLDEN: My Lord, before we proceed to the next stage of this case, a minor matter of housekeeping that I feel would be appropriate at this time.

Miss Smith has been kind enough to have the two books from which she read photographed, and she has enclosed letters with them. I do not propose to file the letters, unless my friends wish.

The text, the letter, however, in each case is contained in the front of a photocopy book, which we had made from the photographs. I intend to file the photographs as exhibits and the photocopied book as either an exhibit or for your Lordship's own use, whichever seems convenient.

The photocopies came out remarkably well, and they are a little easier to handle in a bound form. The text in each case is reproduced at the front of the book without the signature of Miss Smith and is solely explanatory. That is it reprints the first page of the book, and it says a photograph of "A Journal of the Most Remarkable Transactions" et caetera. It then lists the number of folios, gives their size in centimeters-- great precision-- and also in inches, and indicates which ones are blank so that we can have unexplained absences explained.

She also notes in the thoroughness to which we have now become accustomed, that D stands for dorse, which is the back of the

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folio. When one sees a reference to page so and so D, one has to look at the back of that numbered page.

With those explanations, my Lord, I would like to file the two bundles of photographs.

If I may also make one other observation on a lighter note, it seems every time I deal with an archivist I get my material wrapped in a red ribbon. I suppose it's traditional. I shall leave them wrapped with the red ribbon because it is the only way to keep them together conveniently.

THE COURT: Exhibit P-92.

MR. GOLDEN: Which would be the Journal of William Christopher, my Lord.

EXHIBIT NO. P-92: Journal of William Christopher.

MR. GOLDEN: And the Norton Journal--

THE COURT: P-93.

EXHIBIT NO. P-93: Norton Journal.

MR. HEINTZMAN: I understand, although I was not here, that certain objections were made at the time ~~this~~ evidence was admitted last Friday when Miss Smith took the stand.

I have received the material today and I am having some trouble reading it. So it may be that I will want to introduce further evidence relating to this journal as soon as I have had a chance to digest it.

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MR. GOLDEN: I think only Miss Smith can read it with ease.

THE COURT: I am sure that is correct.

MR. GOLDEN: I do have a bound photocopy of both journals, which I have also supplied to all my learned friends. For your Lordship's convenience, I should like to supply one at this time.

THE COURT: I take it that letter of transmittal is there. Is there any objection to that being handed to me as well?

MR. GOLDEN: The text of the letter goes on the front of it, without the signature.

THE COURT: Is that all the housekeeping we have?

MR. GOLDEN: At the moment, yes.

THE COURT: Mr. Heintzman?

MR. HEINTZMAN: My Lord, I am going to lead off, and I am going to call as my first witness Doctor James Wright.

JAMES VALLIERE WRIGHT, SOUTH MOUNTAIN, ONTARIO: SWORN

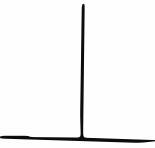
THE REGISTRAR: Would you state your name, your complete address and your occupation.

THE WITNESS: James V. Wright, Box 82, South Mountain, Ontario, Archaeologist.

MR. HEINTZMAN: My Lord, I am handing to the Registrar a copy of Doctor Wright's Curriculum Vitae.

MR. GOLDEN: My Lord, before

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this witness begins to testify, I should ask for an opportunity to make objections to opinion evidence being given by Doctor Wright. I say this with all due deference.

I have not received, nor I am sure that the Court has, any affidavit of Doctor Wright under Rule 482. We have received a document which I think purported to be an affidavit of a Doctor McGhee. My last understanding was that my friend does not intend to call Doctor McGhee. I am not aware if he has changed his mind or not. I simply indicate to the Court that I have no further information.

It seems that, for whatever reason, Doctor McGhee is not being called and Doctor Wright is. I am not sure if his evidence is in substitution or intended to make a different point or what. That is one of the problems, of course, we have.

If the evidence is in rebuttal, it would, undoubtedly, having been familiar with Doctor Wright's work, have to relate to Doctor Harp's evidence.

I am not entirely sure just what in Doctor Harp's evidence my friend Mr. Heintzman proposes to rebut. I think it is incumbent upon him at this point to indicate at least that much so that we can be satisfied that the witness is being confined to rebuttal evidence-- and if I can put a capital on the word rebut and underline it, because if my friend wishes to lead evidence of any facts

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which he alleges in relation to the Plaintiffs' claim, he would, at the very least, if not having to plead it, would have to file an affidavit and deal with it on his own.

MR. HEINTZMAN: My Lord, Doctor Wright is Doctor McGhee's superior at the National Museum of Man. The affidavit or statement of Doctor McGhee was filed at a time when it was not clear to me exactly how the Plaintiff was intending to prove the aboriginal title.

Doctor Harp was led in chief to prove or tending to prove the aboriginal title that the Plaintiffs claim, and I am calling this evidence in rebuttal to that.

We were fortunate, through the evidence of Doctor Harp, to narrow the issue down considerably to where I think the controversy may relate only to whether the Thelon River is to be placed in the same category as land to the south or not. I think I got that far with Doctor Harp.

This gentleman happens to be the one man who has done a dig on the Aberdeen Lake, and I thought that rather than call Doctor McGhee, whose work is of a general nature and who has not done any digs on the Thelon River, this gentleman has and this gentleman is Doctor McGhee's superior. My friend has the paper that Doctor Wright wrote which was referred to in my cross-examination of Doctor Harp about the Aberdeen site, and I propose to file the

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concluding pages from that book, so, with my friend having the Aberdeen site, with my friend having Doctor McGhee's statement, I do not think he could possibly be caught by surprise. We are fortunate to have Doctor Wright, who has come in from the field, available, and he is the only other person who has done a dig on the Aberdeen Lake-Thelon River area that I am aware of.

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With that background, it seems to me that Doctor Wright is the best person to assist your Lordship.

THE COURT: This is rebuttal.

MR. HEINTZMAN: It is rebuttal.

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THE COURT: That is all that is really required.

MR. GOLDEN: I hope my friend will confine it to rebuttal.

MR. HEINTZMAN: Yes.

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THE COURT: Now the CV, you better identify it and we will mark it as an exhibit.

MR. HEINTZMAN: Could we just read it, my Lord, and then we will have it marked as an exhibit.

EXAMINATION IN CHIEF

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BY MR. HEINTZMAN:

Q. Doctor Wright, you have your curriculum vitae in front of you. It indicates that you were born on January 22nd, 1932, is that correct?

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A. That is correct.

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Q. And you are now the Head of the Scientific Section of the Archaeological Survey of Canada, which is part of the National Museum of Man, is that correct?

A. Right.

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Q. And Doctor McGhee works under you in that division, is that right?

A. That is correct.

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Q. Your former positions are-- Chief of the Archaeological Division, National Museum of Man, is that correct?

A. Archaeology Division.

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Q. What period of time are we talking about there?

A. Oh, I have tried to put it out of my mind. That would be back in the-- I believe in the late '60s.

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Q. And then Head of Eastern Canada Section, Archaeology Division, National Museums of Canada, is that correct?

A. Yes.

Q. What period of time is that?

A. That I believe is about 1961-62.

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Q. And Visiting Associate Professor to the Department of Anthropology, University of Montreal, for two years-- is that correct?

A. Correct.

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Q. And what period of time is that?

A. Again I believe that is in the mid-'60s.

Q. And you are the past president of the Canadian Archaeological Association, is that correct?

A. Correct.

Q. You are the past chairman of the Council for Canadian Archaeology, is that correct?

A. One of the past chairmen.

Q. In 1967 you were the chairman?

A. Yes.

Q. And you are a member of the Society for American Archaeology, the Ontario Archaeological Association-- and I note you were the president in 1971, the American Association for the Advancement of Science, is that correct?

A. Correct.

Q. And then an institution called Arctic Anthropology?

A. Yes.

Q. What is that?

A. I don't really know how it snuck in. It has nothing to do with this curriculum vitae. It is simply a publication.

Q. I see. And you are a

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member of the Advisory Committee on Archaeology to the Canada Council?

A. Yes.

Q. And then you have listed your educational career correctly on this curriculum vitae, have you-- leading up to a Master of Anthropology at the University of Toronto and a Doctorate of Philosophy, Department of Anthropology, University of Wisconsin, 1964?

A. Correct.

Q. You have listed your publications on this document. In particular, would you refer to items 25, 31 and 34.

Item 25 is a paper entitled "The Aberdeen Site, Keewatin District, N.W.T.", is that a paper which you wrote?

A. That is correct.

Q. We will deal with that in a moment. Item 31, "The Prehistory of Lake Athabasca: an Initial Statement", would you tell us about that paper?

A. This is a paper dealing with the survey along the north shore of Lake Athabasca and in relationship of the assemblages prehistoric found in that area to the north.

Q. Would you indicate on Exhibit I-6 where Lake Athabasca is?

A. (INDICATING).

Q. Indicating just south of

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the Saskatchewan/Northwest Territories boundary, is that correct?

A. Yes, the survey extended right along the north shore from Alberta and Saskatchewan.

Q. And item 34, "The Grant Lake Site." Did you do some work on the Grant Lake?

A. Yes, a major excavation at the Grant Lake site just north of Dubawnt Lake, on the Dubawnt River system.

Q. And we have had reference in this proceeding to a Mercury Series, orange-covered document, entitled the "Grant Lake Site", is that your publication?

A. That is correct.

Q. We have also had reference to similar documents produced by a Brian Gordon. Who is he?

A. Brian Gordon is one of the staff of the scientific section of the Archaeological Survey who has done considerable work further up the Thelon, particularly in the area of the juncture of the Hanbury and the Thelon River, and then over into White Fish Lake, down, on the Dubawnt, on a major stratified site that I located during the excavation of the Grant Lake site. He came back the following year and excavated that site and produced a report on it, and also done survey on the southern shore of Lake Athabasca.

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Q. And that report he did at Grant Lake, is that the report entitled "Migod, Eight Thousand Years of Barren-Land Prehistory"?

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A. That's correct.

Q. Have you also done work on the Back River?

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A. Yes, I have surveyed down the lower reaches of the Back River near Chantrey Inlet, including Franklin Lake. And I might add that Gordon has surveyed in the headwater lake system of that same river system.

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Q. Have you published any of your work with respect to the Back River?

A. No, I have not.

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Q. You heard myself and Mr. Golden talking about the scope of your examination, Doctor Wright, so I want to start you off in a very narrow spectrum. We have marked on Exhibit I-8 the journey of Samuel Hearne near Yathkyed Lake and Dubawnt Lake. Are you familiar with the Journals of Samuel Hearne?

A. I am.

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Q. Before we get into your evidence, can you just come down and identify exactly where the Aberdeen site is that you worked on?

A. The Aberdeen site is at the extreme western end of Lake Aberdeen on the south shore at the last swift into the lake.

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Q. I am going to mark a JW

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right beside that dot on the southwest corner of
Aberdeen Lake, if that is all right with his Lordship.
I would like your opinion, Doctor Wright, as to whether
when Samuel Hearne found Chipewyan Indians west of
Yathkyed Lake and around Dubawnt Lake whether the same
people were probably living at the Aberdeen site which
you have excavated.

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A. In my opinion there is a
high probability that Chipewyan were at the western
end of Aberdeen Lake at around the same time period.

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Q. Would you tell his Lordship
the facts upon which you rely for coming to that
opinion.

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A. Yes, there are a number.
First, we have Hearne's statement of Chipewyan north
of Dubawnt. This is approximately 100 kilometres--
sixty some odd miles from the west end of Aberdeen
Lake, where the site is located, with the drainage
system of the Dubawnt, establishing a certain
proximity at this particular time period.

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Second, at the Aberdeen site
there was abundant remains of an archaeological or
cultural tradition called the Taltheilei tradition
that historically is represented by the Chipewyan,
and an abundance of this tradition at the Aberdeen
site including late elements in the tradition further
to the west-- further up the Thelon River have been
found in direct association with cut-up European brass
kettles that have been made into various artifacts.

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Third, and running to the south again, down to the Migod site at the north end of Grant Lake-- again approximately 100 kilometres from the Aberdeen site-- the latest component of the Migod site is radiocarbon dated 1685 plus or minus 85 years, meaning that the mathematical probability of the actual date is from 1600 A.D. through to 1770 A.D.

In this component were also recovered, along with artifacts, flakes of a distinctive quartzite that is found in the west-end of Aberdeen Lake that must have been transported down to the Migod site by man.

Fourth, and this comes into-- I do not know whether negative evidence is permissible-- there is no evidence in the Aberdeen site area-- the west-end of Aberdeen site-- of-- I will call it Thule-Inuit tradition of the same time dimension. All of the evidence that I was able to come across was in terms of the Thule-Inuit or the Inuit in that part of the world, in both Aberdeen and down in the Dubawnt, in my opinion, pertains to the 19th century and 20th century.

Q. In your paper on the Aberdeen site you state your conclusions on page 75, and I would just like to refer to a couple of elements in that rather than going through it in any detail.

On page 84 of your conclusions you refer to the diary of J.B. Tyrrell. Can you tell his Lordship what significance you find with respect to the diary of Mr. Tyrrell?

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A. Yes, this is a frequently overlooked preface to the first publication of Samuel Hearne's Journals, produced by the Champlain Society in 1911 under the editorship of Tyrrell.

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In his preface he commented-- and I believe this is a very pertinent comment because Tyrrell made basically the same voyage as Hearne in 1898, a little more than a hundred years after Hearne's voyage.

Should I read the quotation?

Q. Yes.

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A. This is Tyrrell speaking in the preface.

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"The conditions which I found were just such as he (Hearne) describes, except that the inhabitants had changed. The Chipewyan, whom he found occupying advantageous position everywhere as far as the north end of Dubawnt Lake, had disappeared, and in their places the country had been occupied by scattered bands and families of Eskimos, who had almost forgotten the ocean shores of the north, from which they had come."

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Q. What assistance do you

derive from that?

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A. It is a direct historical

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observation that, in my opinion, correlates very well with the archaeological evidence in that part of the world that the Inuit presence in the area was an historic-- a relatively late historic phenomena.

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Q. And then you refer at the end of page 84 to a quote from one of your previous papers. Can you just read the portions starting at the quotations at the bottom of page 84.

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A. It says:

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"The preceding historical references, which are in essential agreement with the available archaeological evidence, indicate a series of population movements for which reasonable explanations exist. The Nahathaways or Cree were in early contact with Europeans and it is speculated that due to a reduction in population resulting from exposure to European diseases or a desire to be closer to the European trading locations, the more northerly Cree abandoned their lands and moved further south. At approximately the same time the Chipewyans had been drawn into the fur trade and since their lands were poorly provided with valuable fur

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animals they shifted into the abandoned Cree territory to obtain the furs necessary to meet their needs for European goods. Similarly, the large areas of the barrenlands vacated by the Chipewyans was occupied by Eskimos."

Q. Does that quotation describe your opinion with respect to the sequence of occupation of the Aberdeen site?

A. This is in the late historical end of it and has a broader application. The Aberdeen site is just one of a number of sites.

Q. In your opinion what date, approximately, and I realize that when we are talking about archaeology we cannot be exact, was the Aberdeen site evacuated by Chipewyans and occupied by Inuit?

A. My estimate would be A.D. 1800. The Chipewyan were struck by a major smallpox epidemic in 1780, I believe. But that is an approximate estimate.

Q. In this paper you have analyzed the historical and pre-historical occupations of this site. There are just a couple of references that I would ask you to refer to. On page 80 you use the initials A.S.T.T. sites of the central district of Mackenzie District. What do you mean when you say "A.S.T.T."?

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A. This was an early term first introduced in the archaeological literature by Doctor W.N. Irving which stands for the Arctic Small Tool tradition, which was subsequently re-named, after a gathering of archaeologists, Palaeocan-- changed to Paleo-Eskimo. Subsequent to this Doctor McGhee has raised the whole issue as to whether indeed the Paleo-Eskimos spoke Inuktutuk.

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Q. Is there an archaeological view of that or is that an anthropological matter?

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A. No, the archaeological facet is that the Arctic Small Tool tradition, or Paleo-Eskimo, if you will-- nobody has been able to directly attach it to say the Thule people, so the assumption of a continuity running from Paleo-Eskimo times straight up to Thule and then into historic Inuit cannot be demonstrated. From Thule up, nobody is going to argue. But there is a major break between the Paleo-Eskimos and later peoples.

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Q. For how long prior to the times of Samuel Hearne, in your opinion, were the Taltheilei tradition, forgetting Chipewyan, occupying the Aberdeen site?

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A. The radiocarbon dates from other sites-- both on the Dubawnt and, further upstream, on the Thelon produce the same sort of material as appeared at the Aberdeen site, suggests an earliest beginning of approximately 500 B.C. and then continuing up to the early historic period as

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demonstrated by the presence of cut-up European kettles showing on stratified sites in varied components.

Q. In this paper do you have a date with respect to the commencement of that period of occupation-- that is the Taltheilei, leading up to the Chipewyan?

A. No, when the Aberdeen report was written much of the information bearing on the Taltheilei tradition was in the process of being put together, so it was not available. Work that was going on Great Slave Lake and particularly farther up the Thelon, near the juncture with the Hanbury. Subsequent to that time there has been considerable research in this area.

Q. Have you read over these conclusions, and do they state your current opinion with respect to the succession of occupations of that site in this area?

A. Yes, basically, except some of the time estimates have changed-- in the light of new radiocarbon evidence, changed geological evidence of ablating ice and such.

Q. Are the earlier periods--

A. They became earlier.

Q. Particularly the commencement of the Taltheilei tradition, I think on the bottom of page 78, you have it as 0 A.D., and is it now your opinion that it would be about 500 or 600 B.C.?

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A. The radiocarbon dates are in the coming. I think the earliest one is 600 B.C., and they are in the 500-600 B.C. area.

5 Q. Otherwise, does this paper contain your opinion with respect to the successions of occupations of the site?

A. Basically.

10 MR. HEINTZMAN: My Lord, may that be marked as the next exhibit.

THE COURT: I-11.

EXHIBIT NO. I-11: "Conclusion" by Doctor J. Wright.

BY MR. HEINTZMAN:

15 Q. Just two other points you raised in the course of your examination, Doctor Wright. You talked about the archaeological assembly associated with the Chipewyans and the Taltheilei. Can you describe what you mean by that word and if
20 geographically you can describe it on Exhibit I-8.

A. Roughly, I think, first, a pre-historian really has four dimensions or areas he can work with. He has the technology: the stone, bone, tools, the way flakes are derived, copper work, et caetera. Then he has settlement pattern, including
25 house structures as well as the way people dispersed themselves across the land in terms of their seasonal cycle, mortuary practices reflecting religious belief and then you have subsistence evidence usually based
30 on the recovering of discarded food bones.

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In the Keewatin District, which is part of the Canadian shield, it is, of course, all basic rocks, so it is a highly acid soil and the bone dimension is basically dissolved except for extremely late historic items or areas where ancient camp fires -- the sodas -- have neutralized naturally acid soil.

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So, briefly, what this comes down to is that the archaeologists working in this part of the world can say something about settlement pattern-- how people dispersed themselves across the country-- tent rings and other such structures. They can also look at the total tool assemblage, which is almost invariably the stone assemblage-- the stone projectile points, lances, arrow heads, scrapers, knives, gravers, celts, et caetera.

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When I am talking about the Taltheilei assemblage, I am talking about a series of distinctive tools that hold together as a group when compared and contrasted to other assemblages-- neighbours outside, for example.

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The Taltheilei assemblage, based on present archaeological evidence, to the best of my knowledge, gets to the western end of Aberdeen Lake. I should point out, perhaps, at this time that in terms of the Thule-Inuit tradition, the closest good evidence I can see is in the Baker Lake area and that the archaeological evidence between Schultz Lake and the eastern portion of Aberdeen Lake is equivocal, so if we start up at the western end of the lake and

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extend down around Dubawnt and come down into Lunan Ennadai, into Northern Manitoba, Seal River, cut across to Black Lake in Saskatchewan, the Saskatchewan portion of Lake Athabasca and then up into Great Slave Lake and swinging up through some of these lakes--

Q. Which lakes are you referring to, for the record?

A. There is such a mass of them in this part of the world--

Q. You are around the "O" and "F" in the District of Mackenzie?

A. Yes. This is particularly Doctor Noble who did much of the survey work in this area. Then back into the headwaters of the Thelon. I think I said earlier that there is no evidence of Taltheilei tradition on the headwaters of the Back River in the lake system or the lower reaches.

It is not just the Chipewyan who were involved in this particular tradition, also the Yellowknife, who were a closely related Athabaskan-speaking population.

Q. The other point is you said you could find no evidence of Thule occupation at Aberdeen sites. Can you explain what you mean by that?

A. Just simply that I saw no physical evidence of early Inuit-- if you want to call it Thule-Inuit tradition material at the Aberdeen site. The only Inuit evidence I found was quite late

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items like sawed bone, wooden chips, an iron knife halved in an antler handle and this sort of thing. So late that, as a matter of fact, I turned the specimens over to the ethnographic collections rather than the archaeological.

MR. HEINTZMAN: Those are all my questions. Thank you very much.

--- short recess

--- JAMES VALLIERE WRIGHT, recalled

THE COURT: Do the Plaintiffs have any questions?

MR. GRAHAM: No, my Lord.

MR. CHAMBERS: I have no cross-examination, my Lord.

THE COURT: Mr. Golden?

CROSS-EXAMINATION

BY MR. GOLDEN:

Q. I gather that you have been able to determine, in relation to the Grant Lake site, which I assume is where I am pointing on the map now, and the Migod Lake site--

A. It is right beside it. It is just a bit further downstream.

Q. Doctor Harp has been good enough to outline the two routes-- the first route -- of Samuel Hearne, and we have been told it is this line on Exhibit I-8-- the dark blue ink line that goes up in a horseshoe shape through the Thelon Game Sanctuary and comes down. That was one of the journeys

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of Samuel Hearne. It was the first one. The one on which he broke his quadrant and had to come back.

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A. I think on the first one he just got barely off the coast and had to go back home. That hardly counts.

Q. The first real one.

A. The first real one.

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Q. Then the second real journey we understand took place, again, from Churchill but travelled in a much more westerly direction and followed very closely to the treeline, at least in the south, and then-- the line is not drawn on the map-- but do you have any idea of the route?

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A. It is the one that terminated up near the mouth of the Coppermine River where his guides massacred an Inuit family.

Q. That was 115 degrees west.

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That is where Coppermine is. It intersects that line. We have a rather ancient-looking map which, unfortunately, we do not have copies of. But it starts

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at Churchill. This is said to be Mr. Hearne's tracks on his two journeys. The first journey is in green and the second one in red to the north and in yellow to the south. Perhaps you could just assist us-- using this, if you agree with it-- and describe for us the route Samuel Hearne took on his third journey, the second real one.

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A. It is a very approximate and rough sort of map taking out from Churchill.

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Athabusgow is Great Slave. So if he is apparently coming up on a transect, something like that, and cutting up through this chain of lakes, then working up to Coppermine, then coming down. The obvious area here on the map is very schematic. It is coming across that narrow section at the east end of Great Slave Lake and this chain of islands. That is where the Talthein Islands are, as a matter of fact. Then he goes down south and back on the same transect.

Q. I have a pen here which marks in red. Would you be kind enough to approximately trace the routes, as best you can, in both directions so that we can see it on the map for later reference.

A. I trust this will be taken as very approximate.

Q. You can be sure.

A. Yes.

Q. You are continuing on the blue line that starts at Churchill.

A. Yes. This indeed will have to be very approximate. This is just a very rough figure. Somewhere here it is breaking down and cutting across Great Slave Lake and then picking up at this transect here. As I say, that is a gross approximation.

Q. You have indicated a line proceeding to the northwest from Churchill, midway through the sixtieth parallel at the Manitoba border, and then almost due west to a lake which appears to be

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Wholdaid Lake, then northwest through to the top left-hand-corner of the letter "C" in Mackenzie, then through the lake system right up to Coppermine; returning, it intersects at the same point at the top left-hand-corner of the "C" in Mackenzie and then breaks to the west, crossing Great Slave Lake, now known as Lake Athabasca, I gather, to the south of it and then proceeding due east to the point of intersection again. That is all done for the record.

Mr. Tyrrell retraced that journey, did he?

A. The last one I was talking about?

Q. Yes.

A. It was particularly this unit up here.

Q. Mr. Tyrrell retraced the first journey. The first real one.

A. I am not completely familiar with this journey. This was the first one, I know, because I was interested in terms of the area north of Dubawnt, so it was that portion of his journey that I concentrated upon.

Q. Perhaps I can use the overlay because we have the sites marked on it. It makes it a little more convenient.

As I understand it, the site that you explored-- it is not numbered-- but shown on the west corner of Aberdeen Lake with a little dot.

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A. Yes, right about there.

Q. You are indicating a dot which is on the southwest corner of Aberdeen Lake, and is approximately midway between the line shown in deep black as 64 degrees 45 minutes north and the line which is shown immediately under that which is 64 degrees 30 minutes, and it is also approximately midway between the two meridian lines.

THE COURT: What is the exhibit number?

MR. GOLDEN: P-9.

THE COURT: Thank you.

BY MR. GOLDEN:

Q. The other site, the Grant Lake site, is not shown on this map I gather.

A. I should clarify an issue with reference to the Grant Lake site. Here it is over here. (Indicating). No, it is just off the map. It is over here.

The Grant Lake site is basically a site that is 8,000-7,000 years old. But just a short way downstream is the Migod site, which is a stratified site which had layered components of occupation that ran up through time starting at, say, with this earliest occupation it sort of had a layer cake of the various sequences of occupations of that part of the world for the last 7,000-8,000 years.

Q. And there was evidence of Taltheilei Shale tradition peoples?

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A. Yes, quite a number of them.

Some of the major components in that site pertained to the Taltheilei tradition, with a number of radiocarbon dates.

Q. That is also true, I understand, of some sites farther to the south, which are again off this map, but are approximately shown by the route of Samuel Hearne. This is a very large map we are dealing with now. It is Exhibit I-8. But down at least to the point of Hearne's journey, where your site is located, is that so?

A. Yes. Well there is Doctor Irving's research in southern Keewatin, then Doctor Nash's in northern Manitoba-- in that particular part of the world.

Q. In fact, there are even modern Chipewyan in there now.

A. Sioux River.

Q. Is it true that the Chipewyan occupation roughly-- and I am not suggesting it is only that for the moment-- but roughly approximated the treeline of the boreal forest?

A. The Chipewyan exploitation of the barren-grounds was a seasonal event. They would move into the barren-grounds, basically, I would say in July and August to exploit the caribou resource, the Beverly Herd, near the calving ground in this particular area we are talking about-- Aberdeen, right now-- and contract back into the boreal forest in the

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wintertime, where they occupy quite a ways in. So there is a fair movement of people. We have, for example, distinctive quartzite showing up near the juncture of the Hanbury and the Thelon that have been found and identified by petrographic analysis on the north shore of Lake Athabasca so, presumably, here we are seeing the northeastern summer extent and then the winter contraction with the herd.

Q. And that is the evidence available to you now, is it not, that that site on Aberdeen Lake is the most northeasterly site of Taltheilei Shale findings?

A. Yes, my evidence-- or at least to the best of my knowledge, the evidence, as I have said, for central and eastern Aberdeen and Schultz is equivocal. It would call for archaeological recognizance test excavation and analysis. But this is not perhaps too surprising in the sense that with the Baker Lake-Thule-Inuit material and then Taltheilei-Chipewyan up at the west end of Aberdeen Lake that there would be a buffer zone between these two people who historically did not get on very well at all. It is not unlike what we find on the other side of the bay with the Inuit Montenier Cree. But there are these buffer zones-- I guess you could call them no-man's lands where your chances of difficulties might increase.

Q. The sites that are marked in black were identified to us by Doctor Harp, who

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worked these sites. I gather you are familiar with his work?

A. Yes, a fine piece of work.

Q. I understand, as a matter of fact, his work on this site inspired you to come into the area or suggested to you to come into the area?

A. That is correct. It is so stated in the manuscript.

Q. The nice thing about you fellows is you write down almost everything you do and we can really find out what is happening. In the area of these sites along the northeast shore of Aberdeen Lake-- sites identified as one, two, three and four and Aberdeen Lake being "AL" and Schultz Lake sites five, six, seven, eight and nine and so on. He postulated that Thule-Inuit would use that river to go and get wood from the basis of the observation that he found driftwood in that area. Would that be fair--

MR. HEINTZMAN: My Lord, my friend is making reference to those specific sites. That was not the evidence of Doctor Harp, and it is not what is shown in his manuscript.

If he is just making a general statement, then that is another matter.

MR. GOLDEN: I think I am quoting his evidence as to their wood gathering at that lake.

MR. HEINTZMAN: But the sites

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that you refer to-- Aberdeen Lake four, five and six were not put by Doctor Harp in the Thule tradition, if you just take two of those sites-- I can see from his manuscript.

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THE COURT: Perhaps you want to check that out. There is no effort being made to mislead the witness.

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MR. GOLDEN: No, not at all. Unfortunately, it takes some wading through. One does not find easily--

THE COURT: That is one of the drawbacks of writing everything down.

MR. GOLDEN: Yes.

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BY MR. GOLDEN:

Q. The evidence, you said, was equivocal. I gather by that you meant it was equivocal as to whether or not it could be Taltheilei?

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A. Or Thule-Inuit, in my opinion. The only unequivocal evidence from that particular area-- including Schultz Lake-- is evidence of very early Indian occupation 7,000-8,000 years ago, which Doctor Harp uncovered. But in terms of later material, I cannot see anything that convinces me one way or the other, other than that man was in the area, there were some stone tools dropped but not of sufficient diagnostic nature to assign to one tradition-- either Thule-Inuit or Taltheilei-Chipewyan.

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Q. What would you think that

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Doctor Harp would think by the protohistoric Thule phase?

A. Well, protohistoric is a term that is used in archaeology to describe archaeological sites that can have European trade-goods on, but the individuals never saw a European-- no face-to-face contact. Trade goods preceded actual face-to-face contact by, in some cases-- in other areas-- known to be well over one hundred years.

Q. Doctor Harp has indicated that he had done work, which I am sure you are familiar with--

A. Yes.

Q. On the north shore of Baker Lake and again on the south shore of Baker Lake. You would not disagree with his findings of Thule-Inuit occupation of those areas?

A. No.

Q. In relation to his work-- and I am sure you must have read it--

A. Many times.

Q. He postulates a sequence-- if I may just refer to page 63 of his paper.

MR. HEINTZMAN: Perhaps I could give my copy of Doctor Harp's work to the witness, if that is satisfactory?

THE COURT: It is okay with me. What exhibit number is that?

MR. GRAHAM: I-6.

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BY MR. GOLDEN:

Q. I do not want to take you through all the phases, but page 63 deals with Phase one, the earliest occupation of the barren-grounds. We are dealing, of course, with the area he explored.

A. Yes.

Q. Going down to "Phase 4: Thule Eskimo Culture",

"Represented by Complex D materials and several additional dwelling sites. A direct transplant of Thule culture probably resulting both from caribou hunting and wood gathering in the middle Thelon Lake's district. Mainly a seasonal expression of the dual Eskimo economy. Can be approximately dated from A.D. 1200-1400."

"Phase 5: Caribou Eskimo Culture".

"Represented by materials that are recent or, at most, protohistoric. The culture of the historic Caribou Eskimos has been thoroughly documented by Birket-Smith, and presently I shall discuss its

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archaeological dimensions, as
far as they are now known."

So far, is that a reasonably
accurate series of steps?

A. There is a bit of a problem
with a simple Thule-Baker Lake area Thule development
into in situ Caribou Eskimo who then exploited the
interior that-- I would agree with Doctor Harp that
there is Thule material there, but it is not well
dated, not well tied down in terms of actual continuous
development, and there are some other problems that
have turned up from linguistic evidence, such that
the Caribou Eskimo-- their dialect relates most
closely to Copper Eskimo rather than to Igloolik groups
which, if you assume that the Thule migration came
down the west coast of Hudson Bay and then pushed up
into Baker Lake and then evolved up into the Caribou
Eskimo, who then, for whatever reason, historically
pushed into the barren-grounds and became specialized
inland Caribou Hunters, there appear to be some
complications with this simplistic model which, in
my opinion, which only continued additional data will
clarify.

Q. The best evidence we have
so far is that we have Thule occupation of what we
might call-- and I take your evidence into account
as to the equivocal nature of the Schultz-Aberdeen
sites, not excluding yours, of course, but the others--
you have the Thule-Inuit findings, clearly, in the

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area. He then says, if I may just quote from page 68,
as part of his Proposition 4, he says:

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"In my opinion, the story must be
interpreted in another way, and
I believe that this fresh
combination of evidence supports
Mathiassen's earlier contention
(1930) that the Caribou Eskimos

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were descendant from the Thule
people. If we assume that the
Barren Grounds occupation
sequence developed essentially
as I have traced it, at least

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in the central Thelon region,
then we see no evidence of
Caribou Eskimo ancestry in the
interior. On the other hand, it

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seems most probable that the
culture of these people was a
resurgence of the inland aspect
of the age-old and almost

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universal dual economy of the
Eskimos, in this case stemming
from the central Arctic Thule
culture."

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That is not the statement with
which the evidence disagrees?

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A. No. There are qualifications.

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This exploitation of marine resources and then interior

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acquisition of caribou, particularly for skin, was an old pattern.

The only point that I was raising is that there are some complications in this because, say, the Copper Eskimo are equally descendant of the Thule, as are the Caribou Eskimo. So the descent of the various Inuit groups is not really in question. We have a bit of a problem as to what particular groups descended out of what area. Are the Caribou Eskimo actually a late movement out of Coronation Gulf or Queen Maud Gulf.

Q. Well, whether or not they are, for the purposes of our particular concern, if I may put it that way, there is no evidence that the utilization of at least the sites in the Baker Lake-- and I am going to now include the upper Thelon River area were in any way broken insofar as they were occupied by Thule Inuit?

A. I have seen no evidence of Thule from Schultz Lake in terms of prehistoric or even protohistoric-- the evidence is, as I say, equivocal. This is where an assessment would have to be made.

I think it can be logically assumed with Thule people down in the Baker Lake region that they would be exploiting resources. All I am saying is that by the time you get up into the Schultz and Aberdeen, except for the western end of it, the information does not permit us to say who was doing it

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or how much. We know man was there.

Q. Yes. I noted also in your paper-- and you mentioned it in your evidence as well-- you refer to an archaeological survey which you conducted, I think, together with someone else. You mentioned an archaeological survey from Chantrey Inlet to the southern end of Franklin Lake in 1970.

A. Oh yes.

Q. And that revealed only prehistoric Eskimo remains-- and I am reading now from page 79 of your paper in the conclusions.

A. Yes.

Q.

"... and evidence for human occupation rapidly diminished as the survey advanced away from the coast and into the interior."

A. Yes, that includes to my survey carried down to the south end of Franklin Lake which is this large body of water. So my survey was up in this area, and I got down here.

Now, my colleague, Doctor Gordon, surveyed through this area and came up with prehistoric and late prehistoric Inuit through this part.

Q. Chantrey Inlet was the place you began, and we have had that marked on the map.

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A. Actually, I started up just above or a bit below Chantrey Inlet.

Q. Dealing with I-8, at the bottom of Chantrey Inlet, above the "E" on "Territories", you went down to Franklin Lake, and then Doctor Gordon.

A. Doctor Gordon-- this central area was avoided. It is an absolutely terrible portion of the Back River as Back's journal aptly describes it, "whirlpools, vicious rapids and such like." No one, to the best of my knowledge, has taken a look at that particular part of the world in terms of archaeology, just the lakes up through here where Gordon has examined and my own work down in the lower reaches of the Back.

Q. The exercise now is to identify when you say "down through here". I am going to do that, if I may. You are referring now to Garry Lake, Lower Garry Lake and the area generally known as Back River, coming from the point of Pelly Lake, eastward.

A. Yes, Pelly and Garry Lakes, as I recall, that Gordon concentrated his survey.

Q. He found evidence of historic and prehistoric--

A. Inuit.

Q. Inuit occupation?

A. Yes, late.

Q. "Late". Would that prehistoric late-- would that be Thule?

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A. Prehistoric could be proto-historic but no trade-goods were picked up that could really tie it down.

Q. We are already aware of the need for putting limitations on archaeological evidence. I do not want to press you any further than you wish to go in terms of what findings really mean. I understand the difficulties.

Down to the east of Baker Lake-- in the study prepared by Doctor McGhee, who is associated with you, we find a rather general reference. This is found in Volume II of the Land-Use Occupancy Study, which has not been filed as an exhibit, and an article entitled, "An Individual View of Canadian Eskimo Pre-History". I just want to refer you to some dating that took place or that he refers to. I do not know, and I am asking you, in a very open way, to help me to determine these sites. He says, at page 114 of the article:

"In Arctic Canada the earliest acceptable dates are..."

And this is "Neo-Eskimo Phase: Thule Culture" as a general heading.

A. Yes.

Q.

"... A.D. 1090 plus or minus 90 and A.D. 1230 plus or minus 60 from northern Baffin Island..."

And I will skip a few in getting

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down to the one I am concerned about which is

"... A.D. 1130 plus or minus 100,

A.D. 1140 plus or minus 100,

A.D. 1140 plus or minus 70,

and A.D. 1260 plus or minus 90

from sites around Chesterfield

Inlet..."

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A. Yes.

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Q. From the number of sites

and the fact that he used Chesterfield Inlet, which is

a geographic name for a body of water which extends

all the way from the coast of Hudson Bay right to

Baker Lake, do you have any idea of what sites he may

have been dealing with?

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A. No, not specifically.

Q. I see. So, we cannot tell,

obviously, from his paper or any work you are familiar

with that he has done?

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A. Well, the dates would

strongly indicate that it is part of the early Thule

portion of that part of the country. But whether

they are right down on the coastal portion of

Chesterfield Inlet or how far up and what specific

sites, no, I could not say at this time.

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Q. You are also familiar, I

take it, with Doctor Gordon's work, 1974, at Baker

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A. Yes.

Q. And if I may just refer you

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to this. It was republished in the Annual Paper of the Archaeological Survey of Canada?

A. Annual Review.

Q. You have read it, I am sure?

A. I presume I have.

Q. If I may just read from a paragraph of that article, and since I do not have another copy, I will just show it to you as I read it. It says:

"While preliminary data from the houses is inconclusive, architecture and Harp's adjacent sites suggests a middle to late Thule occupation. Size and permanency of these houses suggest they were utilized in winter. Barricaded entrance passages, for example house two, in figure two, may have been used to prevent spirit occupation after seasonal abandonment. No doubt the typical skin or snow cover of the roof when removed or melted in spring, effectively destroying more practical barriers to entry by dogs, foxes or birds.

In the limited testing of this site, little evidence, only

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caribou teeth, was found of subsistence either through bone remain or conveyance: dog team, sledge, kayak, et caetera.

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In the absence of further information, until this site is completely excavated by a full-time field party, I am suggesting that its earlier inhabitants were hunting caribou and fishing.

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However, Harp's 1961 earlier conception of the Baker Lake Thule also as wood-gatherers for sledges and kayak claims must be considered."

House two in Figure two was at the Thelon River mouth?

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A. Yes.

Q. That is very close to Baker Lake itself?

A. Yes, I know the site.

Q. That would seem to indicate there was a possibility that they used wood.

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A. Well, I don't think there is too much of an argument in terms of the utilization of wood by Thule culture.

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Q. Yes, at Baker Lake?

A. Yes.

Q. This is just by way of

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trying to have a complete picture of the area. We understand that Miss Clarke has done some work in the Rankin Inlet area, specifically at Melidian Lake?

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A. Yes, it was quite a while ago that I actually read Brenda Clarke's manuscript. That is the Mercury publication.

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Q. No, but rather a paper presented at the Tenth Annual Meeting of the Canadian Archaeological Association. I believe she also did publish in the--

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A. Yes, she published a manuscript on her research.

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Q. She established Thule-Inuit to the west of Rankin Inlet in a small river and a lake known as Melidian Lake?

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A. It is my recollection she was working on Thule and, as I recall, its relationship to historic Caribou Eskimo.

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Q. Is there some substance to the suggestion that the treeline historically-- I'm sorry. When I use that word in archaeology I know that I am inviting trouble-- that in the past the treeline has moved in its location, that work has been done to document the movement of the treeline both east and west-- and north and south as it meets the barren grounds.

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A. Yes, there has been a number of studies on the fluctuation. It is not a hard line. It is a very broad band, but there has been major

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expansions and contractions of this area through time in response to such major items as major climatic change: deterioration of, say, the climate in 1500 B.C. that forced certain trees-- spruce on the extreme northern margin-- killed them, so the forest is always pushing and the tundra is always pushing relative to when the environment favours one or the other.

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Q. Is it not important to the research on the Taltheilei Shale perimeter, if I might refer to it that way, of the barren grounds to try to document at what point in time the treeline moved inward and what point it retreated?

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A. The time depth that is involved, in my opinion, is not sufficient and the climatic change is not long enough or severe enough to have the kind of impact I think you are looking for.

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Q. I am not looking for anything very precise, but it would seem to me that when you found Taltheilei you would also associate that somewhat with the boreal forest or people who spent some time in the boreal forest.

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A. Well, you do. You will find Taltheilei sites in the boreal forest as well as the barren grounds because of their seasonal exploitive patterns to the caribou.

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Q. There would be a relationship of some sort, would there not, between that fluctuating treeline-- and I realize this time depth I am not taking into account-- but there would be a

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relationship between the distance, for example, from the treeline and the finding of this Taltheilei Shale?

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A. This gets into a series of assumptions. If the Chipewyan hunter could get far enough north, where there was bountiful food and exploit it and at the same time contract the southward moving herd as the fall and winter start coming on,

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so they got back in the forest, the factor would be how far can a group of Chipewyan move, you know, when the need is there. So there are a lot of variables.

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If there is plenty of caribou in one region, there is no reason for him or his family to push forward another fifty or one hundred kilometers just because there is caribou up there.

Q. That would be a waste of energy, wouldn't it?

A. That's right. And natives are pretty--

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Q. Your knowledge of the so-called Caribou Eskimo is that they are a nomadic people or that they were a nomadic people?

A. My knowledge is limited to what I have read; articles such as Birket-Smith that indicates there was considerable moving about relative to game supply.

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Q. You referred us earlier to Tyrrell who, as I read in his journals, I understand found Inuit-- he pointed out that he found Inuit where Hearne found Chipewyans?

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A. Yes.

Q. He also found Inuit at Ennadai Lake. Do you recall that in his journals?

A. I cannot really recall that off the top of the head. It could well be at that time period. I just don't recall.

Q. He was exploring just toward the end of the 19th century?

A. Yes, 1898.

Q. It would not surprise you, I gather, if you, on reading historical journals, were to find that Messrs. Christopher and Norton, who first discovered Baker Lake in 1762 arrived there to find Inuit living at Baker Lake?

A. No, it would not surprise me at all.

Q. Does the Inuit, whatever tradition-- the Thule-Inuit or the Caribou Eskimo, either prehistoric or historic, depending on what point of time history stops and prehistory begins-- would they be able to adapt to an inland-caribou-hunting existence in the course of a few years or one generation, or would it take a considerable period of time for them to learn the skills necessary to stay inland?

A. Well, there are a number of factors involved in that observation-- how much indeed were the Caribou Eskimo purely interior? Has this been an aspect that has been, say, a bit over-

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emphasized in the early literature that had some points to make?

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I think the central observation, however, they were in there over quite a large area of the barren-grounds, in my opinion, in the early 19th and 20th century and did survive.

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Q. When they were first discovered at the end of towards the last third of the 18th century, that is by Christopher and Norton-- what I am really asking is whether or not they just popped up there in one generation or would they have to learn their survival techniques over a long period of time?

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A. Well, the survival techniques from just their Thule ancestry, the very fact that they were there when Norton came through, obviously, were serving them well. As I can recall-- and I can be corrected on this, too-- Baker Lake also has some marine resources, even though it is a fresh-water lake. I can be corrected. I believe there are seal and other things that occasionally come into it. Anyway, sitting that close to Chesterfield Inlet, they are not too distant from the standard Inuit exploitation of marine resources and caribou resources that is generally near the coast.

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Q. And you would also not be surprised for that period of time and indeed for some generations before it to find Inuit occupation to the north, and to the east, and to the southeast, and

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perhaps, even though the evidence may be equivocal, to the west of Baker Lake of so-called Caribou Eskimo. I don't use that term in its Birket-Smith connotation. I use it kind of to distinguish them from people that live on the coast and commute.

A. We are talking now basically 19th and 20th century.

Q. I am talking about the time that Christopher and Norton arrived, which is basically the 18th century. Based on what you know, you would not be surprised to find them in the Schultz Lake area and even the Aberdeen area, to some extent, to the north, up around Back River-- I think you indicated that has been surveyed?

A. I can't say about Schultz and Aberdeen. As I said, the information is equivocal and investigation could resolve that problem. In the Back, yes, there is evidence of late prehistoric/historic Inuit in that part of the world. And then certainly down the Kazan, as far as Thirty Mile Lake and then into that general region.

Q. Actually, then there is really no evidence at all-- I think this might be repetitious, but forgive me, it is my last question and I usually repeat something. There is no real evidence at all that breaks that chain of continuity that Doctor Harp spoke of between the Thule and the existing residents of the areas we have been just discussing: that is the areas bordering on Baker Lake.

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A. The only element and, as I raised earlier, the evidence of a good continuity is not what all good archaeologists would like to see and it is something that can be resolved by further research and there is the further complication of linguistic-- the grey-like evidence of the Copper Caribou linguistic relationship as opposed to groups of Igloolik where, if they were part of a Thule sweep down the west coast and then moved into Baker Lake, presumably their dialect would be closer to the Igloolik dialect than to the Copper Caribou and also Messilik Inuit.

Q. Well, the Inuit adapt in lots of ways, and I suppose dialect can change; can they?

A. Oh, the linguists get very sticky about this.

Q. Are you a linguist?

A. No, I have some linguistic training but I make no pretensions of being a linguist.

MR. GOLDEN: Thank you very much. Those are my questions.

MR. HEINTZMAN: I have one question.

RE-EXAMINATION

BY MR. HEINTZMAN:

Q. Doctor Wright, my friend referred you to Doctor McGhee's article in the Inuit Land-Use Occupancy Study. Are you familiar with his

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article, having the same title, Individual View of
Eskimo Prehistory found in the Canadian Archaeological
Association Bulletin Number 7 for 1975?

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A. I am.

Q. Are you aware that it
contains another chapter which was not reproduced in
the Inuit Land-Use Study?

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MR. GOLDEN: I do not understand
how this arises from my cross-examination, my Lord.

MR. HEINTZMAN: Well, my friend
put the--

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THE COURT: The article was put
to him.

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MR. GOLDEN: What I was putting
to him were a series of dates that I found in the
article. That is a very thin reading on which to
develop some new chapter which we have no knowledge of
at all. Unless it relates to dates and Chesterfield
Inlet, I do not think it arose out of my cross-
examination at all.

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MR. HEINTZMAN: Well, I think
it does.

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MR. GOLDEN: Well, if it
relates to dates and Chesterfield Inlet, I withdraw
my objection. But I know my friend is good enough to
know whether he is going to lead this.

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THE COURT: We will see,
Mr. Golden. I have this in mind.

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BY MR. HEINTZMAN:

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Q. Are you aware that there is a portion of the article written by Doctor McGhee which was not reproduced by Doctor Freeman in the Inuit Land Use Study?

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A. Yes.

Q. What is the entitlement of that part of the article?

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A. Neo-Eskimo Phase II: Historic Eskimo Culture.

Q. And does Doctor McGhee deal with the Caribou Eskimo in that portion of his article?

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A. Yes, he does.

Q. Do you know why Doctor Freeman did not include it in the Inuit Land Use and Occupancy Study?

A. I wouldn't care to comment on that-- second guessing an editor.

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Q. Can you read what Doctor McGhee says on page 74, starting at the bottom of that page.

MR. GOLDEN: Just a moment. It has nothing to do with the dates. I object.

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MR. HEINTZMAN: I think it does have something to do with the dates. It has dates right in it.

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MR. GOLDEN: It may have dates right in it, but it has nothing to do with the dating of carbon remains in Chesterfield Inlet which was

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what my question was about. As I said, it is only a thin reed. It is non-existent.

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MR. HEINTZMAN: My friend asked about dates because it had some relevance to the occupancy by these people in that area.

THE COURT: Again, I can only say go ahead, and I will decide.

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BY MR. HEINTZMAN:

Q. Would you go ahead and read that paragraph, Doctor Wright.

A. Just the one paragraph?

Q. Yes.

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"It seems likely that the Caribou Eskimos of the Barren Grounds, the most distinctive of all Central Eskimo groups and sometimes thought of as the most primitive and ancient of Eskimo cultures, develop their interior adaptation at this time. No archaeological traces of a prehistoric interior ancestry of the Caribou Eskimos have yet been found, and it seems likely that they moved into the Barren Grounds only after this area was left vacant following the decimation of the Chipewyan by

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smallpox around 1780."

MR. GOLDEN: That is that old paper that we had before. It sounds like the last paragraph of the paper that was filed with Doctor McGhee's affidavit, and nothing whatever to do with Chesterfield Inlet.

I take objection.

MR. HEINTZMAN: I think my friend made his objection. Your Lordship ruled that the witness would read the paragraph. I wonder if he can finish that.

MR. GOLDEN: No, I don't want it being slid in by pressure. Either it is relevant to re-examination --

THE COURT: This is very, very remote, as far as I can see, from the questions that were asked and answers given on that paper by this witness.

MR. HEINTZMAN: I thought that my friend--

THE COURT: Unless you can tie it--

MR. HEINTZMAN: My reference to dating, my Lord, was to assist this case. The whole point is that Doctor McGhee has written specifically on this issue and, if my friend wants to get into that by reading Doctor McGhee's article to him, I want to read the rest of the article.

I would have thought that

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perfectly proper re-examination.

THE COURT: As I remember the question it does not seem to be related to it; however, go ahead and I will look at all of it.

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BY MR. HEINTZMAN:

Q. Would you just complete the paragraph, Doctor Wright?

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"We may suspect that the indirect influence of the 18th and 19th century European whaling and trading industries resulted in changes in the cultural and economic patterns of Eskimos living throughout the Eastern and Central Arctic."

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Q. Insofar as the dating by

Doctor McGhee in that paragraph, do you agree with it: that is of the Caribou Eskimo moving into the interior?

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A. Yes. Actually, I would

even put it later in terms of 19th and 20th century in terms of major interior-- now we got the point when does interior leave off and when does a short sojourn from the coast become a major interior penetration?

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MR. GOLDEN: There is no way

of striking this stuff from the record. All I can ask your Lordship to do is not deal with it or not recognize it, and I think my friend knew better.

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MR. HEINTZMAN: Thank you very much, Doctor Wright.

My Lord, I have another matter which I raised with my friend and he indicated his views on it. I had certain pictures taken of Baker Lake when we were there.

For the same reason I ask questions of witnesses in Baker Lake, I want any court which has to deal with this matter in time to understand Baker Lake the same way as your Lordship did, and a photograph is worth a thousand words.

I had Mr. Doichler, sitting beside me, take these pictures and I don't think he and I take any pride in the photography from a professional point of view, but I would ask that these be admitted in evidence. I think that they fairly portray the town.

I have told my friend I am willing to withdraw any that he takes any particular objection to. His attitude is that no, there is none that he wants withdrawn but he would like some others included--

MR. GOLDEN: No, that is not my attitude.

MR. HEINTZMAN: Anyway, I would like to put them in evidence, and I am prepared to call Mr. Doichler if the Court wishes to have him called, and I would like the photographs to be introduced into evidence.

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THE COURT: Maybe Mr. Golden will explain his attitude.

MR. GOLDEN: My Lord, there is a procedure, of course, for putting in documentary evidence which includes photographs. Had I known my friend wanted to do that, I would have at least made sure that the photographs were typical and representative of the area. I would have also asked, as I am now, what possible relevancy that could have to the issues in this case.

Dealing with my first point first: we have all seen Baker Lake. I don't know whether my friend, Mr. Heintzman, saw the same parts I did. I viewed all the photographs. I spent longer there than Mr. Heintzman and visited in many homes there. I did not see what I would regard as a typical view of Baker Lake at all. I saw a very modern, new portion of Baker Lake and I saw some equipment scattered about-- snowmobiles and three-wheel Hondas and that sort of thing.

I am sure my friend wishes to make a point with these pictures. In my view, and the reason I am not agreeing with him, is, firstly, the set of photographs is by no means representative of the community of Baker Lake. It excludes all of the housing, as far as I can tell, north of the first street. I can tell that because a considerable amount of it is one-room small housing which is certainly not represented in those photographs.

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In addition, I don't know why we are fighting this issue. I don't know why the physical appearance of Baker Lake, any more than the fire sirens-- well, of course, that may be some issue-- any more than the way people get dressed there is relevant.

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Dealing with the photographs, the physical appearance of Baker Lake, I cannot imagine what issue it bears upon, and in view of my position that it does not even fairly represent the community-- the physical aspects of the community, I would take the most strenuous objection on the non-relevancy, as well.

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It might be all very good fun, interesting if it did represent the whole community and I might not be so strenuous in my objection but I have to take the position that it is irrelevant-- and if it did go in, I would have to take the position that other photographs would be justified, as well, in reply, as it were. And I am not in the position physically to do that. I had only the barest of notice.

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When my friend was showing me these photographs I thought, as everybody else here has traded photographs-- it turns out he had something different in mind. I had no way of knowing that.

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MR. HEINTZMAN: The only issue of relevancy of the photographs relates to the issue

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as to the nature of Baker Lake and why it is a different town today than it was twenty years ago and there perhaps may be some association between that and the fact the caribou do not walk down the centre of the street. That is one of the issues that has been raised by the Plaintiffs in their evidence.

THE COURT: I suppose so, Mr. Heintzman, more to the point, that the way of life in Baker Lake that has been disclosed in the evidence up to now is very much different than two or three families living together and following the caribou around the country-- none of which you have pictures of.

It seems to me that the point of change in the way of life has been well made in the oral evidence. I know that any appeal court would wish to see those from an interest point of view, but I honestly have to think that the town itself, perhaps, and the change in it over the past couple of decades is not really the change that is important.

MR. HEINTZMAN: Fine, my Lord. I will hold onto them in case we need them for the appeal court.

Ms. Koenigsberg will lead the next witness. I am sorry. Ms. Koenigsberg is going to go ahead with the next witness.

MR. GOLDEN: Are my friends alternating their witnesses here?

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THE COURT: Well, the mining companies have been regarded as one party in many ways. I take it we have a witness who perhaps would like to get away.

BARBARA MARIA MIODUSZEWSKA, VANCOUVER, B.C.: SWORN

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THE REGISTRAR: Would you state your full name, your address and your occupation for the Court?

THE WITNESS: Barbara Maria Mioduszevska, 2930 West 33rd Avenue, Vancouver. I am a geologist with Cominco Ltd.

EXAMINATION IN CHIEF

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BY MR. COSMAN:

Q. Mrs. Mioduszevska, I understand you have been a geologist with Cominco Ltd. since March of 1973?

A. Yes, I have.

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Q. You are a geologist. You have graduated from the University of British Columbia in 1970 with that degree?

A. Yes, I did.

Q. And you are a Fellow of the Geological Association of Canada?

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A. Yes I am.

Q. And approximately four days ago you were in the field?

A. Yes.

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Q. Now, I understand that since 1973 with Cominco Ltd. you have field experience

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in five of those six years, is that correct?

A. Yes, that is correct.

Q. Has that field experience

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included experience in the Northwest Territories?

A. Yes, it has.

Q. Were you in the barren

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grounds in the Northwest Territories?

A. Yes, I was.

Q. Can you identify on this

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map, Exhibit I-8, where you were located in the

Northwest Territories?

A. I was working west of the

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Thelon Game Sanctuary and south of Bathurst Inlet near

the Hakit River area.

Q. And what years were you

working as a field geologist in that area?

A. In 1975 and 1976.

Q. And which months in 1975

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and 1976?

A. In 1975 we started work at

the end of April, and I was there until early

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September. In 1976 I was there from the end of May

until mid to end August.

Q. Do you know how long Cominco

has been carrying on explorations at that site?

A. At the Hakit River camp or

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Camp Lake camp we have been there since 1970.

Q. Can you describe where the

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base camp at that site was located?
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A. The main camp is at Camp Lake and it is on the east side of Camp Lake along an esker.

Q. Now, at my request, did you prepare a sketch of the camp?

A. Yes, I did.

Q. Is this the document that you prepared?

A. Yes, it is.

MR. COSMAN: My Lord, I would tender that as the next exhibit.

THE COURT: I-13.

EXHIBIT NO. I-13: Sketch of camp.

BY MR. COSMAN:

Q. With respect to the exhibit in front of you, I-13, would you describe the camp and its facilities?

A. The camp itself consists of sixteen to seventeen buildings, of which four are permanent structures in that they are constructed out of plywood or plywood and fibreglass. One building, the core shed, is the largest. It is constructed of plywood, lumber, glass windows and a corrugated-tin roof. The other structures are semi-permanent in that they are tent buildings. They have plywood floors and walls and doors but canvas tent over the frame and a tarp over that.

Q. With respect to the sketch you have prepared, have you located those structures

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on that sketch?

A. Yes, I have.

are on the sketch?

Q. Can you identify where they

side of the lake.

Q. North is in what direction?

Have you marked that on the sketch?

A. Yes, I have.

of you?

Q. Do you have a copy in front

arrow is shown at the top of the sketch.

A. No, I don't. The north

or a square with "core shed".

Q. I see. And I see a building

A. Yes, that is the core shed.

written on top. What is that?

Q. And apparently, just to the

usually stored our empty drums to be flown out on the next available flight.

A. Adjacent to the dock we

a dotted line with H.

Q. And there is a circle with

to the helicopter landing area.

A. That was our helicopter

landing area, and most of the fuel was stored adjacent

also small circles in and around the lake, which is

Q. On this sketch you have

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marked as Camp Lake. What do those circles represent?

A. The circles represent the drilling which we did in 1975.

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Q. Would you describe the mining exploration activity that was conducted in your camp and out of your camp in the spring and summer of that year, 1975?

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A. During that year we did drilling, geophysical surveys, geochemical surveys, mapping and core logging.

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Q. And associated with that activity what equipment did you have in your camp?

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A. We had a diamond drill, of course, to do the drilling. There was a Cat in camp. Not only to bury the garbage and move the fuel around, but also to move the drill. We also had a helicopter in camp most of the time.

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Q. Were there skidoos?

A. Yes, during the early part of the season, that is in April and May, we used two skidoos to get around in the snow.

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Q. How is power provided?

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A. We had a small generator adjacent to the kitchen just to run the freezer to keep the meat frozen.

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Q. And how many persons would there be in that camp as an average in the spring and summer of 1975?

A. As an average, twelve to

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fifteen. It got up to as many as twenty-six at times.

Q. In the course of your work out of that camp and in that camp in 1975, did you sight any caribou?

A. Yes, we did.

Q. Would you describe where you sighted the caribou that you just mentioned?

A. The caribou we sighted were generally in two areas. One moving across the esker.

Q. Is the esker marked on this sketch?

A. Yes, it is, with the arrow head type of designation.

Q. That would start towards the top right-hand-corner of the map?

A. Yes, the caribou moved by our camp, along the esker, across the esker, along the south shore of Camp Lake, across the east shore of Camp Lake and then in a northward direction; and we also saw them on the northwest side of Camp Lake.

Q. Have you indicated the movement and direction of the caribou that you have sighted on this sketch?

A. Yes, I have. The arrows indicate the direction in which they were moving.

Q. What arrows are those?

A. The green arrows. That was the direction they were moving in, in the springtime.

Q. Can you describe the

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occasion on which you first sighted the caribou?

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A. Well, it stays in my mind very well because I have never seen caribou. It was my first time in the barrenlands. We had an Inuit working at the camp. Early one morning we were awakened by cries, "Caribou!" "Caribou!" They were pointing across the lake. I would not have recognized them as caribou because they were standing very still and they were grazing. It is only later that I realized that they actually were caribou, and there are a few of them there.

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Q. And how many did you see?

A. That particular time?

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Q. Yes, and after that time, as well.

A. That first time there were just a few. Maybe half a dozen at the most. And then in the course of the next week-- I guess it was a northward migration, we saw them groups of anywhere from two to two dozen at any given time.

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Q. For how long did you see them that week?

A. Well, during that week about a seven-day period, approximately.

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Q. And they were moving in the direction you indicated by the green arrows on the sketch?

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A. Yes. They stopped and grazed very often.

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Q. What is the distance from the camp to the green arrow to the path of the caribou as indicated on this sketch?

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A. Do you mean from the helicopter?

Q. Yes, take it from the edge of the camp-- from the helicopter pad.

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A. Five to six hundred feet.

Q. And were there mining activities conducted in the week the caribou passed the camp?

A. Yes, there were.

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Q. What activities were they?

A. We were carrying out a diamond drill program, as well as having aircraft-- well, helicopters into camp.

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Q. Would you describe the diamond drill program? What does that involve?

A. It involves, of course, a diamond drill. We were doing wireline diamond drilling. The drill was situated across the lake from the camp, and the building itself is a structure-- the drill itself is housed in a building that is about twelve by twelve feet. It is a plywood shack.

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Atop that is a tripod which is between twenty and thirty feet high. It has a pulley system. This is for the wireline to retrieve the core once it is drilled. Outside the shack there is also a salt water tank, a pump to pump water and, of course, core

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boxes and various parts needed for the drill. At various times the Cat was near the drill.

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Q. Why would the Cat be near the drill?

A. To move the drill from one place to the other.

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Q. Is there a noise associated with drilling?

A. Yes, there is.

Q. Can you describe that noise?

A. Well, it is a very loud, vibrating noise.

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Q. Does that noise carry?

A. Yes, it does.

Q. Can you estimate how far that noise would carry?

A. Well, it would depend on the wind. You could certainly always hear it in camp.

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As the crow flies from where we were drilling to the camp it was at least-- at maximum distance, say two thousand feet. So it easily carried that. It would easily carry a mile-- half a mile. If the wind was blowing in the right direction, say, we were away from camp and walked towards camp, we could hear the drill from a considerable greater distance.

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Q. In addition to the drilling, you referred to helicopter activity in and out of camp. What was the purpose of that activity?

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A. It had a number of reasons.

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We were putting out crews to do mapping, we were doing geophysical surveys in the early part of the season, and just slinging core from the drill to the camp.

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Q. On the sketch you have an X marked on the south side of the lake. What does that represent?

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A. It is a survey marker. When Cominco started working in earnest in the area we put up a number of legal survey posts in the Bathurst North Mine property, and they are used to tie in any geophysical surveys or any diamond drilling, then we can survey them directly to the survey marker.

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Q. Can you describe that marker?

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A. Yes, the base of it is painted white and has a white tarp on it. Then a post was secured to it. I believe with concrete. The post is, say, four by four or five by five inches, and it is about four or five feet high.

The post is red and white.

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Q. And where were the caribou on the south side of the lake in relation to the structure you have just described?

A. Frequently grazing right around it and moving right by it.

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Q. We have heard some evidence in this trial that stakes with ribbon are associated with mining exploration activity. Have you ever used such stakes?

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A. Yes, I have.

Q. Would you tell the Court if it is necessary to have ribbons on stakes for mining exploration work?

A. No, not at all. Very frequently-- in fact, the geophysical work which I was associated with on this property-- we put out a geophysical grid and we marked the stakes with a carpenter's pencil or indelible marker, giving the location of that particular point.

Ribbons, especially-- it was cold then and they would tend to get torn off. Actually, it is flagging. It is not ribbons. It is plastic flagging. It would get very brittle and break off.

Q. Were there any other occasions during that summer and spring where you sighted caribou?

A. Yes. It was at the end of June that I left the camp for two or three days to help out on a mapping program, some twenty miles south of this camp. I was out on traverse one day, mapping. I was mapping with my assistant. She was about five hundred to a thousand feet away from me. We were carrying on two parallel lines, and I came down to a slight hollow-- slight low spot and I saw some caribou that I had not noticed before and, of course, at that instant they saw me as well. I was not sure what to do because apart from the caribou that

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I had seen, say, five hundred feet from me around the lake, I had really not come across caribou.

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I wanted to get to an outcrop right across this slight low spot. The low spot had good grazing, a lot of grass, and that is where the caribou were. The outcrop was on the other side. I really was not sure what to do: whether to turn or run-- whether they would chase me. I knew I could not outrun them. Or, whether to deviate from my course. That outcrop was right there. So, finally I just sat down and decided it was lunchtime and watched them.

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I guess they just watched me in return and we sort of formed a mutual admiration society.

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They came quite close. Once they saw me-- I mean they were aware of me-- they started grazing and walked quite close to me. Finally I decided it was time to carry on, so I walked across this clearing and they moved slightly to one side, and, in fact, followed my path for a short distance where I was mapping, and they went off to my right into another area.

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But they certainly did not run away from me. I was really glad I did not run away from them.

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Q. Were there any other occasions that summer when you sighted the caribou?

A. Yes, the next time I can

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recall I was coming back from this mapping, two or three days in the south, and we sighted some caribou when we were flying back to our camp. We sighted them from the helicopter.

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Q. Can you describe what happened on that occasion?

A. Well, yes. This time I had my camera with me, and I was quite keen to get a picture. I had not got one yet of the caribou. Because out on traverse I try to keep my pack as light as possible and I don't have a camera with me. I saw the caribou from the aircraft, so I asked the pilot if he would mind going a bit lower. And he didn't want to. He said there is no point in scaring the caribou.

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Q. What height were you flying?

A. Oh, gosh. Five hundred feet or so.

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Q. Were there any other occasions that summer when you sighted caribou?

A. Yes, when I got back to camp I guess, the northward migration was still continuing and we saw groups of caribou across the lake from us. In fact, one morning I remember we got up and I thought we had an usually late frost because the rocks at the other side of the lake looked like they were lighter coloured, frosty. Then we realized it was not frost on the rocks; it was a herd of caribou that were stationary right across the lake from us.

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They were grazing there, paying no attention to either the camp or the drill. Drilling goes on twenty-four hours a day. It does not stop at night.

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Q. Did you again sight caribou in the vicinity of the camp late that summer?

A. Yes. I guess this would have been early August we noticed a few caribou coming back from their northward trek-- just a few groups-- small numbers.

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There is one incident, yes. There was a young yearling right in camp, actually. This was on the northward migration. We assumed-- well, it had either a sprained ankle or broken ankle. It was limping. I guess it got left behind by the herd, and it stayed right in and around the core shed and helicopter area and the tent.

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Q. How long did it stay in the area?

A. I don't know. Several days. Less than a week. It was three or four days anyway.

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Q. And you also say that you were at that camp in 1976. Was that the same camp at Hakit River?

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A. Yes.

Q. Did you sight caribou in 1976 in the vicinity of the camp?

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A. Yes, I did. We saw, basically, one large herd go by. It followed the green

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arrows that I have indicated on this-- across the
esker and between Camp Lake, Sunken Lake and carried on
northward along the edge of Camp Lake. There were
several hundred in the herd. They just moved by the
camp.

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Q. For how long did the caribou
pass the camp in 1976?

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A. Roughly about the same period
of time. . Several days to a week or so.

Q. Did you see caribou on any
other occasion in the summer of 1976?

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A. Yes, it was towards the end
of July or, again, early August when they started their
southward migration. Our pilot was coming back from
picking up people to the north and west of our camp.
And, from the air, he saw a large herd. He estimated
seven to ten thousand, going south. It was about two
miles from camp. Later that day we flew out to a high
point and watched the herd from three-quarters of a
mile or so-- to a half a mile.

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Q. Do you know if Cominco has
contracts with contractors that provide helicopters for
their field work?

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A. Yes, we do.

Q. Do you know if there is a
condition in those contracts relating to game or game
protection?

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A. Yes, there is.

Q. Can you tell the Court what

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that condition is?

A. There is a clause in the contract that the helicopter will not be used for hunting or harassing game.

MR. COSMAN: Those are all the questions.

THE COURT: Perhaps we will find out if anybody else has any questions. Mr. Chambers, do you have any questions?

MR. CHAMBERS: I have no cross-examination.

THE COURT: I wonder, Mr. Golden, if you rather start your cross-examination in the morning or now?

MR. GOLDEN: May I have just one second?

THE COURT: Surely.

CROSS-EXAMINATION

BY MR. GOLDEN:

Q. Your camp is operated under a land-use permit; is that so?

A. Yes, starting in 1976 land-use regulations came into effect in that area. Prior to that there were none in effect.

Q. I see. It may be that the documents we have do not cover this area. They would be outside the area. Your camp was where, again?

A. It is south of Bathurst Inlet and west of the Thelon Game Reserve, just east--

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it is called the Hakit River area.

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show.

south of the word Bathurst, in any event?

A. Yes.

is?

A. No, I am sorry, I don't.

caribou?

A. That's right.

Kazan area?

A. No, I haven't.

I don't want you to give away trade secrets, but what type of mineral were you exploring for in that area?

A. The Bathurst North Mines deposit is a well-known one, and we were looking for copper, lead, zinc, silver and gold. It is called the massive sulphide.

about flags. I wonder if you have seen this kind of ribbon before?

A. Yes, I have.

Q. Where do you see that?

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A. Generally I purchase them on rolls.

Q. This is Exhibit P-90?

A. Yes, and they are used for a variety of purposes.

Q. Can you describe some of these, please?

A. Yes. Everything from putting out-- tying on to trees or bushes, say, to mark a route through the woods or tying on to packs, for identification, to tying on to--

Q. Stakes?

A. They have been, yes.

Q. I suppose after you have been in there a little while, you can find a piece of ribbon around various spots in the area?

A. They don't seem to be too common. You mean lying around?

Q. Tied to bushes and stakes and trees?

A. No. You know, it's such a harsh environment that everything gets torn off. We have tied them on only to find that they were torn off, so we have gone to writing on them or, better yet, spray painting stakes, markers. Or, if we do tie them, it is a question of winding it around and not having anything loose so it can get torn off.

MR. GOLDEN: It must be nice to be working so close to nature.

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RE-EXAMINATION

No further questions.

BY MR. COSMAN:

Q. You referred to flags in your evidence. My friend showed you what he described as a ribbon. Is there any difference between a flag and this ribbon?

A. Could I see it?

Q. Yes.

A. No, this is plastic flagging.

MR. COSMAN: Thank you very much.

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THE COURT: Thank you very much. Nine thirty.

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