NATIONAL LIFE STORIES

AN ORAL HISTORY OF BRITISH SCIENCE

Dr Charles Swithinbank

Interviewed by Dr Paul Merchant

C1379/03

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| **Interviewee’s forename:** | Charles Winthrop Molesworth |
| **Occupation:** | Glaciologist |
| **Mother’s occupation:** | Naturalist |
| **Date and place of birth:** | 17/11/1926; Pegu, Burma |
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Okay, could I just start by asking you where and when you were born?

I was born in Burma, in Pegu, Burma on the seventeenth of November 1926 and that was because my family was out there; my father was a District Commissioner in the Indian Civil Service, the Burma Division, and he married out there and they produced two children in Burma. It’s only when we reached the age of about seven that it was customary to have the mother bring the children back home to England for schooling and from then on it was a sort of split family and I only saw my father for six months every two years. That at the time was a very generous leave allowance, but for a growing child of course it meant he was just not there.

Thank you. I wonder whether we could just start by you describing your earliest memory.

Earliest memories in Burma, we did a lot of travelling. We were of course… my parents were part of the British Raj and therefore very high standard of living compared with the locals, and lots of servants, but my father really loved the people and didn’t like the trappings of the Raj and used to go into the jungle by himself, which was not popular with the Burma police who were British, because some of the British were murdered by rebels. But my father spoke Burmese fluently and used to go into the native villages unaccompanied, but dressed as a Burmese, sit down cross-legged and hear all the gripes of the villagers, and I noted that in his obituary, written by a Burmese, he died in 1956 I think, he was described as a one-man special investigations bureau because he got so much out of the natives that no other white man would get out. And he was highly respected and loved the life. My mother said many years later that the only reason he never became Governor of Burma in the normal course of promotion was that they thought he was too close to the natives, which in an Empire sort of colonial situation is regarded as a sin. But my father thought quite the other way, that it was an important part of the job to get close to the locals.

Thank you. We’ll cover Burma in some detail in a moment, but if we can just go back to grandparents. I’ll do it sort of systematically, so your paternal grandfather?
I met my paternal grandfather only once, when he was very, very old, in fact senile, so I have no memories about him really.

_And your paternal grandmother?_

No, she was dead by the time I came into the world.

_and your maternal grandfather?_

He too, I think was dead.

_and your maternal grandmother?_

I have no recollection. I think she was dead probably. You see, because seven years since I was born in Burma and there was no chance of getting to know any relatives till we came back after seven years.

Yes.

Came to this country, and I don’t remember. I remember one meeting with my paternal grandfather and his nose dripped. The sort of thing a child would have noticed of a very old man.

_I wonder then, could you say anything about the role that stories about grandparents had in your early life or life, so in other words, can you remember anything of what your parents said about your grandparents?_

No, I can’t. My mother was good at reading stories of adventure and exploration to her children and that definitely had an effect on my life, because her message was don’t get stuck in an office like your father. In fact it’s a bit unfair on my father because he travelled more than most District Commissioners in Burma, but I took the point and wanted something which involved travel and not a routine job with a sort of stepladder promotion through life. We notice with the people I worked with later for many years, when they do a few years in
the Antarctic and come back, most of them move on to something else because there are very few permanent posts available, or there were when I was a young man, I mean I was one of the first. And the story we love to tell is that their fathers when they come back say to them, well, after two years in the Antarctic now you must find a proper job. Well, for anyone who wants to stay in the business, they’ve been in a proper job all along.

_Mm. Why do you think that your mother gave you that advice then if, as you say, your father actually was a bit of a traveller?_

[0:06:49]

Well my mother was an adventuress herself. She would go in the jungle with one or two Burmese. She loved wildlife, she was told to have an elephant gun to protect her because there were wild elephants who would attack so she became the only person in Burma who could wield an elephant gun, which has a hell of a kick apparently, because it’s large bore, and the only elephant she ever shot was at the request of villagers because it was a rogue elephant, had been trampling things in the village.

_George Orwell’s got an essay on something quite similar. He was sort of working there and had to shoot an elephant and he said that he did it almost to sort of avoid looking sort of inept, you know, he felt that he sort of had to do something for the sort of natives to see it happen._

Yes.

_So she said that you shouldn’t get stuck in an office like your father. Could you say any more about how then she viewed him and his job at that time?_

She enjoyed the trappings of being married to a District Commissioner and really had no interest in what he did in the office, but did enjoy getting close to the people and was very easy and friendly with people. And we had, as any British family would have had then, we probably had eight servants of different kinds and that was normal. So from that point of view it was an easy life. But being away from one’s friends in England may not have been easy for my parents, but for the children Burma was our life at that time, so we loved it.
Could you describe the landscape of Burma as you remember it? And if you could in, as part of that, describe not only the sights, but the sounds and smells and that sort of thing as well?

[B:09:19]

Burma is dominated by the Irrawaddy River running down the middle and the densest groups of population are all beside the river and they take fish from the river, they use the river for irrigation and so it’s really the heart, heart and soul of the place and I remember going up and down in ferries, up and down river, and my family even took our own horses on the boat. I mean there were four of us; two parents and two children and we each had our own horses and when we travelled for any reason, we would travel with our horses on the ferry boat. And I remember that. I remember that my father was considered to be a VIP, which he didn’t like very much, he wanted to be close to the people. And I never went to school until we came back to England and so had a lovely free life really. There were always enough servants to accompany us if we wanted to go riding or something, but often we went into the jungle with my mother and with one or two of the boys, as they called the servants. And so I don’t have a lot of memories of that, but I remember it was a very happy time, all my time in Burma. Except I had a strange disease which caused me to freeze up, caused my hips and knees to freeze up. No pain, but they wouldn’t bend and this of course worried the medics. Didn’t worry me because it didn’t hurt. But for quite a long time I had bouts of it, I had to be piggy-backed on the back of the servants and I was put to bed sometimes with my knees bent and the doctors said they thought it might be rheumatic fever and that really came into the story when I was going to the Antarctic because you would refuse to take anybody who’d had a history of rheumatic fever. I mean years later when I did have a heart problem the cardiologist said it’s nothing to do with any childhood disease and so when first going to the Antarctic in 1949, I did actually tell a lie, which has been with me ever since, but would have changed my whole career if I hadn’t. Launcelot Fleming, who later became Chaplain to the Queen in Windsor Castle after being Bishop in Norwich and Portsmouth, he was halftime Director of the Scott Polar Institute in Cambridgeshire at the time and a fellow of Trinity Hall and a keen rowing man, and he was asked by the organisers of the Norwegian-British-Swedish expedition 1949-52 to interview Cambridge people who had said they would like to go and, very friendly, easy going with people, he interviewed me and it greatly amused me that he was in training with the rowing at the time as I was, and he’d rowed for his college
and he was a coach and I was rowing for my college first eight. And it’s very important on an expedition to pull your weight and not only on the easy things but on the difficult things and the dirty work, you all have to take a share of the dirty work. And it amused me greatly that he took me rowing in a pair-oared boat on the Cam and on a pair-oared boat, if one is slacking the boat will turn into the bank [laughs] so it was a real test. He was fit and I was fit and we made a very good pair. So I passed that test. But then he said do you have any skeletons in the cupboard, and that’s when I told him a lie. I said no – because I was reported to have had rheumatic fever. Well I’ve been absolved of that lie since by a cardiologist who said it was extremely unlikely, but it certainly pained me. On the other hand, it’s made my career to lie like that. An interesting moral dilemma!

*Could you say then, as a child how you felt about having that problem, or you wouldn’t have known what sort of illness it was at the time, but having that problem, particularly having to be carried around and losing independence?*

It was fun, it was sheer fun being carried around and I teased the servants mercilessly, being carried around, and as it never hurt, I don’t have any unhappy memories about it at all.

*Given that you didn’t go to a school, could you say how you think that you learnt about the world? In other words, how you learnt about perhaps aspects of science or literature, how you learnt, you know?*

[0:15:57]

No science at all while we were in Burma. And literature, yes, my mother read Scott, Shackleton, Livingstone, adventures like that. And that certainly stuck with me. And so if I’d not gone to the Antarctic I probably would have joined the Colonial Service in Africa. Of course the Antarctic activities have gone on longer than the Colonial Service which has expired. But I’d been on an undergraduate expedition, two undergraduate expeditions, which in fact helped me to get on the Antarctic expedition because if you’re going to live with somebody for two years you don’t want people who are going to cause trouble, you want reasonably compatible people. And so having been on undergraduate expeditions meant that they could ask my colleagues whether I was a pain in the neck in the field or under stress, and I think they did. And I seem to have survived that. And that was undoubtedly a good
point. There were actually only three people on the shortlist for my job, Assistant Glaciologist – I learned this long afterwards – and going away for two and a half years at the time was considered not a great prospect for most people. For me it didn’t matter at all, I loved the idea. I was not married, had no attachments and so that presented no difficulty for me. So I may have got in – because I was pretty poorly qualified; a geography degree for glaciology is a grossly inadequate background, although there are some, nowadays there are some very good geographers who’ve turned into glaciologists because their schooling was better than mine. My schooling at public school was during the war and the best mathematics teachers went away to fight the war and we were left with second string teachers in mathematics, physics, chemistry, all of the things which I should have had to be a glaciologist. But glaciology was in its infancy and by choosing aspects that I could do better than other people I was able to stay in the business.

We’ll come on to your later schooling and National Service and military training and Oxford. Sticking just with Burma at the moment, I want to just go back to what you said about your mother reading those stories of exploration. Did you have a sense that that was quite a common thing for a parent to read to a child at the time, or do you think it was something particular about your mother’s own interest that meant that she picked it?

[0:19:30]

I think it was very common to read to children, but probably my mother was the only one of the white people we knew who would have read stories of exploration, because it was her interest. If she’d been a man she would have loved to have taken part; of course it was absolutely unheard of in those days, well, even for most of my career, for women to go to the Antarctic. Luckily it’s free now and they do. But, so I think that was unusual.

Where do you think that this interest in exploration, which as you say was unconventional for a woman at the time, where do you think that interest came from, where did she pick up that interest herself?

Interesting question and I don’t really know the answer, except that her family were, they were clerics on both sides of the family and their ancestors had travelled a lot and so probably had a pretty broad view of the world. I don’t know their history, they may have had
time as missionaries which involved a lot of adventure in the nineteenth century. But I don’t have any better answer to that question.

And would you, could you describe your mother’s role in your informal education, apart from the reading of these stories? In terms of visits to the jungle, encountering the landscape, that sort of thing?

[0:21:20]

The love of wildlife and the love of the native people and the fact that we didn’t like the feeling that we were superior to them, because when you get to know any native people you realise that you are certainly not superior to them, they’re just in a different culture. And so all along, I was inculcated with a respect for the people and could never mishandle the people as whites who went to the colonies later in life tended to look down on them. As a child that didn’t happen, they were people and equals as people, then and since then, I’ve never looked down on the locals and that’s why perhaps even a couple of years ago I felt at home in Burma as a visitor.

As a child do you remember seeing examples of treatment of locals that wasn’t as benign as it seems your father’s interest and your own and your mother?

I do, although I don’t have any feeling against particular families. We mixed with the other white families around, judges’ families. The judges travelled. I think there was a travelling judge, but a lot of local disputes were settled by the District Commissioner and obviously my father was much respected for that because there were very few murders. When there was a murder the judge was brought in from Rangoon to solve it.

You said that your father was keen to be not treated as different, not to be treated as a VIP. Can you remember, and if so could you describe any examples of how the local people treated him as special and...

Well I can, I’ve got it written down, I can give you a one page example out of the unpublished memoirs of a District Commissioner and he related how my father dressed down and therefore was not immediately recognisable as a symbol of the Raj. He was a white man
obviously, and conspicuous in that way, but this story – and I’ll give you a copy of the page – is that, an Anglo-Burmese, Franklin was his name [Sir Eric Franklin], his diaries are unpublished, and are in the British Library and he related the story that they were on the river ferry, which was several days, and my father was travelling without any retinue among a hundred Burmese, and he sat down cross-legged with them, which was a very unusual thing for a white man to do and since he knew the language he could befriend them. And they wondered who on earth he was, what white man would behave as he did and one of the... There was another white there who was an ex white Russian. Of course a lot of white Russians exited before the Revolution, to escape the Russian Revolution, and spread all over the world and this chap became a railway inspector on Burma Railways and he was white and he witnessed my father behaving like this, talking to the local people, and said, ‘Where are you going?’ and he said the name of a village, I can’t remember, but I’ve got it in writing [Henzada]. And the Russian railway inspector said, ‘Do you...Where are you going to stay in this village?’ Well the Raj always stayed in houses that were kept for them wherever they went and the railway inspector was of a, considered a lower order of humanity, but since my father was so easy and friendly he said, ‘Well sir, if you don’t have any lodging I’d be happy to have you in my house’. And my father replied, ‘That won’t be necessary, thank you much’. And when they got to the village where they were both getting off, the white Russian was surprised to see a delegation of people; the police in their best uniforms, and didn’t know who this reception was for and, it was for my father which was the normal method of greeting a District Commissioner after he’d been travelling. And so the white Russian hung on the side of the welcoming committee until they had said their nice words to each other, at which point they were moving off. And my father saw this Russian from out of the crowd and walked over to him and said, ‘I’m extremely grateful for your kindness in offering me accommodation and I hope we meet again’. That sort of thing showed his attitude to the locals.

Yes. Did you, do you think as a child – you said that you moved from Burma when you were seven – so as a child under seven were you aware that he was unconventional…

Yeah.

…then?
I was.

*It’s not just reflection since, yeah.*

Yes, certainly.

*And you’ve spoken about your mother reading to you, your mother introducing you to a love of nature.*

Yes.

*Could you say more about time you spent with your father and what you did – did you do particular things with him?*

[0:28:57]

Did very little with my father. He was very busy and a bit stiff I suppose you would say, always kind to the children but just played very little part in our upbringing, so I don’t think I’ve got any answer to that question really.

*That’s fine. Your first house would presumably have been a colonial house in Burma then, the first house you remember?*

Yes. We had a house in Rangoon, which I tried to visit a few years ago but with a military government it was surrounded – well the whole area was surrounded by a fence and military. But the house is still there, I’ve discovered, and I looked for our other houses in other villages and showed the locals – this is when I went back in the last three years as a tourist – and so I had the photographs, I said do you remember this house? And they were very diligent in searching and one of them drove me round Pegu, which is where, the city where I was born, on a motorcycle, which was quite terrifying, on the pillion, and consulted really old men who might have known, but didn’t recognise that particular house. So that’s all I remember about that, but I’ve got photographs you see, my mother was a very good photographer, and so got photograph albums and again, with what I told you about needing to preserve history I’ve given them to the Institute of South Asia Studies in Cambridge,
which is part of the university and they have a bundle of papers from my Burma days and family and some of my father’s correspondence and so that is recorded. Some of the photos I kept copies of, but I thought it important the albums with my mother taking photographs all over the place is really part of the historical record because not many of the wives of District Commissioners bothered to take photographs, you needed a large quarter plate camera with glass negatives in it, which was difficult to set up and work, but my mother loved it and so it is something of a unique record and that’s why I’ve made sure it’s preserved.

Do you remember one of the houses, perhaps the one that you stayed at most, in enough detail to describe, to sort of take me on a tour round the rooms inside and describe?

[0:32:13]

No, I don’t. I don’t. There was one that I thought when I went to Maymyo [now Pyin U Lwin], which was a high up, 4,000 foot village that a lot of the Raj disappeared to in the hot season, because the hot season is pretty awful, and we all had houses up there and there was one that I had a photograph of which resembled a house that I saw while being driven round the village looking to match this photograph. And it wasn’t exactly right though, I thought it might have been modified, so I went in - I had a car and a guide, you can afford that in Burma these days as a tourist – and went in and my guide asked the proprietor whether she’d be prepared to talk to me. Well it turned out that she was pretty good at English and she was very happy to talk about the possibility that this was one of our houses, but she told me who owned the house in the twenties and thirties and it wasn’t my father and it wasn’t the government either. But she showed us over that house and it was unchanged, probably last, best part of a century, but now used as a hotel and I remarked on the fact that there were no guests and this was in the tourist season. And she said well it’s owned by the government and the only people we ever get here is a few Burmese. Well that fits because everybody concerned about the situation in Burma today advises you to avoid government owned hotels and government owned airlines, which my travel agent was very careful to do. So that explained why this… I mean you’d put it down as a one star hotel nowadays, certainly no more, but the rooms were exactly as they were in the 1920s and thirties and fireplaces and so on and verandas and it was very interesting to get this guided tour by the manager of a hotel without guests.
Lastly on, well, just a couple more on Burma and then we’ll move on. Could you talk about your relationship with your sister? I’m right in that you’ve got one sister?

[0:35:14]

One sister. She died quite a long time ago [14/11/1990], I should think between fifteen and twenty years ago. My relation was always as a jealous boy because she was older and she was much more of a mother’s girl and much more obedient, I was probably a little rebellious from the start. And so we always went together, but I was never close to my sister at any time of her life and so as I say, we were with, together with and I never fought her particularly until we were back in England after 1933 and the worst crime then was we were having a pretty fearsome argument and I threw a pen at her and this was in the days when you had a pen with a pen nib and it was reminiscent of a cowboy movie because the pen stuck in her head, twanging [laughs] and of course I was duly beaten for this, which was a dangerous thing to do. But there was always a tension because she was cleverer than I, she passed all exams and I didn’t, and she went to Canada, was evacuated during the war later, that’s all later, and went to Newnham College Cambridge and was a medic for her life. But I wasn’t close to her at any stage of life.

And the jealousy that you mention, could you say a bit more about that in terms of your life in Burma, what that meant?

Well, she was… when you are four and six there’s a big difference in your sociability and so she was the one that people talked to and I think this is understandable that you… an adult chooses a child that can talk freely and so I was always a bit left out and I’m quite sure this had a permanent effect on me and must have played some small part in taking on an unusual activity where conventional learning mattered little, but ability to get on with people, other people, not my sister, was very important.

How does that relate to feelings of being left out when you were younger then in relation to your sister?

Difficult question really. If you… you see, we didn’t have much interaction with other children and the white families, British families there we did have interaction with their
children and that was all easy and pleasant, but out there we otherwise only had… our friends were the servants in the house and so I probably, looking back on it, although I don’t know because I’ve become more sociable, probably was fairly much of a loner in my youth and therefore needed to find a niche, and I did find my niche and it was a career.

_Could you say anything about politics at home, in other words, did you have any sense of the sort of politics of your parents, as a child, their views?_

[0:39:52]

Not until we were back in England when I discovered that they were both socialists. But from the point of view of people who were much better off than the working classes and so they probably thought this unfair, I’m sure they thought it was unfair. I remember my father was a member of a socialist club when he came back – he didn’t come back until 1942 when the Japanese threw him out of Burma, well the invasion threw him out, he escaped over the hills to India – but he was involved in a pretty passive way with socialist interests in England. And my mother had shown an interest in farming and when we were back in England she eventually bought, after the children had flown the nest, she bought a four acre smallholding near Maidstone in Kent and kept animals: pigs, goats, cattle, horses and did all the work by herself, it was a one-man band. And sold enough wildlife, no, I mean domestic farm animals, to break even. Never made a profit but she was not interested in that at all, she just enjoyed the work. So I remember when – and I’m talking about the 1940s, late 1940s – agricultural workers had become well enough off in a pretty humble way to buy second-hand cars, which they certainly never could have before the war, and my mother saying how wonderful it was to see the farm workers driving around in second-hand cars. So that I think indicates socialist tendencies.

_And at this time of your life in Burma, can you remember anything of the sort of morality of your home? In other words, were there things that your parents insisted on in terms of your own conduct, that sort of thing, how did they, in what ways did they teach right from wrong?_

Only example, I can’t really think of any other way. I don’t think my mother ever spanked me until we came back to England at age seven and I was a naughty boy and she spanked me
a few times, but always for very good reason. So beyond that I don’t know the answer to your question.

At the age of seven you moved to England. Could you first of all describe the move itself, in other words, the journey?

[0:43:17]

Three weeks in a ship through the Suez Canal was the normal time from Burma to Tilbury, I think we came into probably. And we always loved that time because here we were, passengers on an ocean liner - Bibby Line it was usually - and mixing with the other white passengers because there were no Burmese, virtually no Burmese passengers at the time. But my father did out of his own, had out of his own salary paid for some Burmese people to go to school in England and that was very unusual among the Raj to do that, but they were by British standards at the time very highly paid. I remember my mother whispering to me that my father was paid £3,000 a year and this was a very high salary, but that was the Indian Civil Service for you. I mean in terms of ranking, the Indian Civil Service was considered top of the tree for scholars. Foreign Service number two and Colonial Service number three. And so Indian Civil Service were the highest paid civil servants except I suppose the senior government people in this country, probably.

And could you describe or say how you felt about the fact that you were moving from Burma back to England to live?

[0:45:08]

We didn’t know what England was like. It was the normal thing, we were with whites and so it was a looking forward adventure rather than regrets. And the one thing I can remember on the ship, I was so badly behaved that when we got to the Suez Canal my mother took my sister Jane to visit Cairo and you could get off the ship at one place, go to Cairo and catch it up at Port Said, the north end, which she did. But I wasn’t taken because I was so badly behaved and I was consigned to a white friend on the ship to look after while they were away and he spoiled me silly to make sure I didn’t misbehave and I certainly didn’t, but I was very
jealous of my sister having been taken to Cairo and it was very many years before I made up for that by taking my wife to Cairo and a Nile cruise.

*When you say you were badly behaved, what did that consist of, the behaviour? What was the behaviour that was bad?*

Normal childhood provocation I would think, refusing orders from parents or others. Just being generally disobedient, rebellious.

*Thank you. You moved then to a house called Redcroft?*

[0:47:01]

It was Redcroft [now 466 Loose Road] and later got a street number, but it was Redcroft and it was on the south side of Maidstone, two or three miles out. A big house; three storeys, and my mother was able to afford to buy the plot next door so that it was not built on because she was a very, very keen gardener. She had a degree in horticulture from before she married. And so she had this very big garden which she looked after all by herself with no help. I mean she did the hard digging and everything by herself. So that was, I think it’s built on now, but during the time we were there until the fifties it was not built on. So she did everything and laid the lawns, grew vegetables, flowers, made a pond, did all the concrete work herself, made a small swimming pool for my sister and me, which during the war she converted to an air raid shelter. I mean she was very… she was as tough as any man by… because she was fit when digging and never had assistance, but the air raid shelter, the swimming pool was fifteen feet wide I suppose and thirty, thirty-five feet long. When the war came and we had risk of bombing because we were right on the way from German bombers to London, she put a gable roof on with two by fours and corrugated iron on top of that and then a foot of soil and grass on top of that so that it became an innocuous mound in the lawn and would have been extremely good bomb shelter, short of a direct hit. And so she did everything because my father was absent and when he came home he wanted to visit old friends and I don’t remember him doing much because he was divorced from his interests in Burma when he came home for the six months every two years.

*Did he spend time with you on those visits?*
Very little because he was very formal and tried not to be, but I think probably a very highly... he had a very highly disciplined upbringing, whereas my mother let us have a great deal of freedom, and so he probably didn’t feel very close to his children. He did feel close to his daughter because she was academically inclined, but not very close certainly. But he and I respected each other, I respected his life and occupation and here was I, an ordinary schoolboy, growing up and we didn’t have a lot to do with each other, we didn’t go travelling together. But during his six months I think he couldn’t help keeping up with what was happening in Burma by going to the India Office in London to check on things, so I don’t remember much. I mean my mother was a hundred per cent more involved in my upbringing than he was.

*How did you feel about his closer relationship with your sister than with you?*

Jealous.

*Did you express that in any way at the time?*

Probably by being naughty in order to become noticed. Any opportunity I could, I was naughty. I remember after a big battle with my mother once I ran out into the front drive near the road shouting, ‘Help, police, murder!’ which was completely crazy because [laughs] I was just having an ordinary family argument with my mother, but got very frustrated and must have lost my temper. That’s not something I would recommend to any other child to do. If the police came along they would not have been pleased, but I think a neighbour looked in and my mother explained.

*Can you think of other examples of misbehaviour at this time which is, you know, when you were back in England in Redcroft House?*

No I can’t. There were a lot of little things probably that I was difficult. But we had a live-in maid, I mean that was normal in the 1930s. I remember she was paid fifty pounds a year, was a standard salary. But... plus living in the family, that was normal and I was very good
friends with her because she didn’t have to discipline me in any way. And so I rebelled against discipline. But this is not unusual among growing boys, not unusual at all.

_Do you remember any of your father’s relationships with old university friends? I’m thinking here of the relationship described with Lytton Strachey for example, is that something you learned about afterwards by reading a biography or were you aware of it at the time?_

[0:53:50]

I… my mother told me that they were good friends but I didn’t know anything about it until I read those biographies of John Maynard Keynes and Lytton Strachey and Maurice Collis in Burma. No, I didn’t know anything about him at all. I knew that he had Oxford friends because he would go to Oxford to visit them, but otherwise, no, it was all what I discovered afterwards in reading the books.

_And could you describe the relationship between your mother and your father, the kind of…_

My mother and my father? It was not close because their interests were so very different. My father was a classical scholar. He got a double first in classics in Oxford and this was so far removed from my mother’s practical nature and love of horticulture, and in fact becoming qualified in horticulture, and so far above his children, particularly rebellious ones like me, no. So we were not, we were not close. I always had a great respect for my father because I knew he was an important person and I don’t think I ever tangled with him, but then that was because he didn’t have to take a disciplined attitude to me, we had very little to do with each other and therefore I think there was a faint sort of mutual respect. Certainly I respected him very greatly because I knew he was a distinguished scholar.

_Thank you._

Much later in life and after he retired when he came back from Burma, and before that, I learned he was one of many authors of a medieval Latin dictionary. I mean dictionaries, medieval Latin dictionaries didn’t have a lot of people reading medieval Latin and explaining the context of the words as used, that’s how dictionaries are compiled and he was doing that. I didn’t know anything about it really until I discovered his card catalogue after he died.
Do you remember the Redcroft house so that you could do what I asked before, in other words take me on a tour around…

Yes.

…describing the rooms?

[0:56:53]

Yes, I can. Downstairs was a dining room and a kitchen and a second class sitting room, more suitable for the children. Upstairs was the drawing room, which was formal, for visiting guests, was my bedroom and my sister’s bedroom – separate – and a spare bedroom. And then two floors up, what do we call that these days? We called it the attic, but it was the third floor. I get so mixed up with Americans and British who have different ideas about the second floor.

*It might sometimes be called loft or landing.*

It was, it was a converted loft, yes. My father lived there. So we each had our own bedrooms from an early age and I retreated up there when I wanted to be alone, I mean when my father was not there, which was most of the time, and made a little cubbyhole in the unroofed part of the attic so I could escape from everybody. My secret compartment, which my mother didn’t discover until she sold the house, I think while I was in the Antarctic. And there was an outside, there was an outside loo, there was an inside loo and bathroom, but there was an outside small room which was for the washing machine. Again, it was quite a privilege to have a washing machine. And it had a mangle on, electric mangle on top, which was a normal thing. You picked things out of the wash, no spin dryer, and you put them through the mangle. And my mother did all the washing. I don’t think the maid had anything to do with that. The maid was responsible for general house cleaning and cooking. But my mother was outdoors most of the time. So I do remember that house quite well. And then eventually when we got our first car, which must have been about 1937, my mother built a garage and so we had it in a garage. But we had all the space of the extra plot next door where, I mean the street had average upmarket-sized houses and plots and we had two. And
the… our garden opened on to the local recreation ground, which was very nice because children could escape into the recreation ground and go and do what they liked there or watch cricket or watch football. My mother was very free, never worried about us going out alone, that was part of the adventure of life. I mean we had to be taught to cross a road safely, but beyond that she would… I don’t remember her ever worrying where we’d got to, she knew that we would come home when it was suppertime, which we did.

*Can you remember the sorts of landscapes that you played in? I don’t know how far you strayed from the house, whether you cycled or what, but can you remember the sort of landscapes of your childhood, the outdoor places, could you describe those please?*

[1:01:10]

Well you see, the most wonderful thing we did was to go camping with my mother’s brother and his children and in 1937 and ’38 we ventured to the north of Scotland as a family with four or five cars, which again, was very privileged existence at the time. With tents, we always lived in tents and never at any campsite, although there weren’t public campsites in those days, you wrote to a farmer in a place that you had decided was nice and said could you pitch tents in their field. And I mean we had a loo tent and so on and we dug a hole in the ground as we would in Burma, this was nothing unusual, so it was just a farmer’s field. And we pitched our tents among the cars, we could drive the cars on to this and again, you see my father was absent but my uncle was there with his whole family and we were all of us allowed total freedom and I had a canoe and the only time they got worried is when I went far out to sea to an island on a calm day because naturally, like any parent, they were thinking well what happens when a storm blows up and my children are stuck in their canoe on this island. But it never did, we never had any trouble. But it was lovely adventure, so it was a family adventure; unconventional in that we were allowed to do what we liked and we went walking and so on, but it was a very good lesson in independent camping which I imagine when I started camping in the Antarctic there were no surprises because I had pitched tents before and realised that you don’t have any facilities, if you want a loo you dig a hole in the ground. And it was just a very memorable time and I’ve got photographs. And last June I went on a tour of Scotland with a girlfriend and had the photographs of one of these camps in 1938 and sought out the place and took photographs from exactly the same
place that my uncle had taken photographs in 1938 and I’ve got those and not many changes. But…

What sort of landscape was that?

[1:04:24]

That was west coast of Sutherland, so hilly, small cleared farming area at the head of a cove, offshore islands, hills with tarns, but no other tourists there at the time. I mean there were very few tourists in those days, certainly very few who lived in tents, so I don’t remember, on several camping holidays I don’t remember ever seeing any other family in tents. But since we’d had to camp in Burma, albeit with lots of servants, that was nothing strange for my mother, running a camp, and she was fully equipped. And for her brother who had been a medic in Fiji and had come to stay with us in Burma for six months and they travelled together, so he was totally familiar with camping and there was never any difficulty in that, we all had our duties of tying up. But interesting that we really knew about rainy climates because the big tents, we dug little ditches round, which was normal Boy Scout procedure if you were in a rainy climate so that you didn’t have a flood inside the tent because a lot of you were sleeping on the floor of the tent. But that was standard procedure and nowadays you go to a public campsite and you don’t see anybody doing that, they’ve all got sewn-in groundsheets and they don’t worry. So we were very organised and took folding tables and cooks’ stoves, primus stoves and one member of the family must have gone into the local village every day to do some shopping I imagine. But those were great adventures and that’s why last August, last June I chose to go and revisit one of those sites because it was such an important part of my upbringing.

How often, was this every summer or more often?

It was every summer in the latter half of the 1930s.

Were you aware of social class? You said that you felt privileged to have two gardens, a canoe and this sort of thing, but were you aware of class difference?

[1:07:18]
Oh yes, we were. But when I went to a fee paying prep school in Maidstone and there were, because it was fee paying there were very few working class people there and so I was aware when meeting people from the village school that they didn’t have the privileges that I did. Yes, I was aware of class distinctions from an early age. I think probably everybody was in those days.

How did you meet children from the local non-fee paying school then?

Basically, I didn’t, as far as I remember. There were one or two exceptions, but mostly we didn’t associate much… we did with some neighbours, yes. We had neighbours with children the same age and we were good friends with those, but I don’t think anybody in the 1930s could have been unaware of the big class distinctions in society. And we still are.

Would you please describe your, this first school then that you went to in England?

[1:08:56]

Yes, it was a fee-paying prep school called Hill Place and it was on the other side of Maidstone and I think we got trolley buses to get there and we were taught reading and writing and I get horrified when I see the reading ability and writing ability of people the same age as I was. I see today how, except in fee paying schools, but in local schools the articulation, the writing is appalling compared with me at the same age. But this was not a pressured prep school at all, it was just an average prep school for people who could pay the fees.

Could you describe the environment of the school, the interior and the exterior?

[1:10:03]

Well actually there are two first schools. The first one was called St Christopher’s and I think I stayed there until, probably only about a year because I don’t have many memories, but they certainly taught me to read and write there. And then went to Hill Place which was a bit further out and was a fee paying day school and I don’t remember how many pupils, but
I would think fifty, and run by the headmaster who had been a rugger player in his time and so liked outdoors and sport and we went camping as firstly Cub Scouts. I don’t think I ever got further than Cub Scouts, but we had several large camps with, I mean our staff were the teachers and we were people from the school and this was again, pretty normal at the time and we… I forget where we were, but we went to the south coast and were left pretty free because schoolteachers were not paranoid about their charges getting hurt as they are nowadays and we, oh we swam in the sea and we did hikes and so on. And I remember we secretly prepared for a midnight tuck as it was called, a midnight feast, and I overheard one of the teachers telling another teacher that the boys are having a midnight tuck tonight. Well they weren’t supposed to know about it, it was secret, but they didn’t break up the party, they just let it happen.

Do you remember any particular lessons at that school?

[1:02:30]

Not really. We did Latin and normal school subjects. Latin was normal at the time. And when I was… my mother wanted us to learn French and I’m sure my father did as well and we’d been to stay with a French family who had one house in Lille and another at Wissant, which is on the coast halfway between Calais and Boulogne, halfway between Cap Gris Nez and Cape Blanc Nez, and it’s still a nice little coastal village there. And the people who, family who lived in Lille had a house in Wissant and one summer I went with my mother and sister and the following summer went alone. Nowadays people consider that a scandal that a nine year old boy goes alone, but it was nothing for me; I had my passport, I knew about tickets, I knew that if you got into trouble you should ask for a policeman. And yes, I went, I was put on the train in Maidstone and went to Dover, got on the ferry – I had all my tickets and passport – got off in Calais and then took the train to Lille and I imagine I was met by the family there. And then we moved to Wissant on the coast, summer holiday. But the first few days I was there I remember I… there were boys my own age playing on the beach and of course we wanted to converse and he was speaking and I was hardly speaking French at all. We ended up conversing in Latin because we both learned Latin in school. [laughs] That was something which doesn’t happen very often. But I was very good at languages, well I have been ever since, and I quickly became fluent in French.
Do you remember any science teaching at that first school in England?

No.

Geography?

Geography certainly, yes.

What do you remember of geography teaching at that school?

Oh, conventional, different countries, conventional school geography. Naturally learning what the capital city of different countries was, but not particularly exciting.

Any fieldwork or mapping, surveying?

[1:15:35]

No. It was not until I went to secondary school that I did a course in survey, which actually came in useful in my professional career. But I don’t know why, but I must have been interested in survey from the age of twelve onwards and one of the teachers – this is Bryanston, fee paying public school in Dorset, Blandford – taught me plane table surveying and then as the war progressed and we needed food, we dug up part of the grounds to plant vegetables and in order to know what was there, I was asked to make a plane table survey of this, I suppose half acre site, which I did alone, setting out stakes to take sights on, setting out a baseline. I remember doing it all by myself and produced a decent plane table map of this vegetable plot. But looking back on it, it slightly amazes me because I must have been about fourteen and I did it all alone. But then in that school there were a lot of individual projects and a lot of freedom. A great deal of freedom, I mean we had a canoe, we could go on the river and go up and down river by ourselves. This was tremendous education for a young boy in terms of learning to look after yourself in whatever situation. And I rowed in school, but we had to have one day a week at least doing public spirited sort of things and this plane table survey was part of it.
I'm going to come on to Bryanston in just a second. Could you just mention though reading, you said that you learnt to read at the sort of pre-secondary school schools. Could you say what you read, what sort of things you read to yourself, if you did?

[1:18:10]

No. I remember one thing I did but I can’t remember at what stage, in which school it was, but I was never any good at Latin, but I realise how important it was and how much of our culture came from Latin and I started on my own translation of Julius Caesar’s invasion of Britain, translation into English. And – just for fun, in spare time. But in terms of passing exams, I was very undistinguished at Latin, but as a hobby it was a different thing.

I haven’t asked, you may need to go back to Burma just to answer this question, but perhaps not. Do you remember anything of your parents’ faith or religion?

[1:19:09]

I remember that they were not interested in religion. Both sides of the family, father and mother, were children of clerics and they reacted against the discipline of the church and so they never inculcated us with Christian values or any other religious values. My sister went on to get confirmed and I didn’t, could choose of course. But I was in the school choir at, my first, at Hill Place and I think I may well have been for the first year or two at Bryanston in the choir. Church was compulsory in Bryanston and I enjoyed the choir because I enjoyed singing. In fact church music has always been one of my great favourites in life. But I’ve not been a practising Christian at any stage of my life, but of course it’s a very large part of the culture I come from so…

I wonder whether you remember any popular science at this time before you went to secondary school? I’m thinking of perhaps radio programmes or magazines that promoted science for young people – (a) whether they existed in your sort of world and (b) whether you remember being interested or taking it up?

They probably existed but I really have no recollection.
Fine, thank you.

[1:21:16]

Okay, could you please describe what you can remember of your arrival at Bryanston for the first time?

I was the youngest boy in the school. My mother had visited several schools: Canford and Bryanston, before placing me there and what she liked about Bryanston was the fact that the headmaster seemed to know the name of every boy in the school and there were 300 boys, and this is pretty unusual. So he was a very kindly and sympathetic man and when I was naughty later on it hurt me that I hurt him because he was a very good man. But that was all later. So I was young and I was bullied as is very common for the youngest person there, and I was not happy about that, but I never complained to anyone because it’s part of life in a public school, you do get very… you do get mistreated by your elders and bullying is very common in schools. But of course gradually you learn how to cope with it and live with it. But as the youngest boy, I had everybody older than me and was learning a lot rather rapidly because I had to in order to establish my own position in the school. But all that is inevitable if you’re the youngest boy. The reason I was the youngest boy in the school is because when war began on third of September 1939, I had been put down for Bryanston but I would have gone probably in late 1940, but the headmaster realising that we were living right in the path of what would be a German bombing campaign I might like to, my mother might like me to go to Bryanston earlier, and she agreed. And that’s why I was admitted earlier. And I was very happy about that because I was not achieving much at home and that was a total break with home and getting away with one parent, so thrown into school discipline, but escaping from mother’s discipline.

Could you just explain what the bullying involved, what sort of form it took?

[1:24:29]

Good question and I find it difficult to remember. There was very little physical aggression, but I think approaches by homosexual boys who were more advanced in puberty than I was, and I gather from colleagues that this is very normal, to pick on the younger ones like that.
But I managed to brush ‘em off alright. But at one stage the headmaster heard somehow that I was being pushed by a homosexual and called me in and said tell me about this and this boy was severely disciplined, very nearly thrown out of school because he was behaving that with other small boys. That again is a normal public school experience in the early years I think. But… so I can’t remember the content of the bullying. It’s simply that you were looked down on by people one year, two years older and this again is probably very normal. And it may be that it has an element in my rebellion that I was a nobody and wanted to become somebody with a reasonable amount of self-respect. And I forget at what stage, it must have been 1940 after I’d been there a year that this gun cotton came into it and that was of course fun because it was illegal, illicit and not allowed and we were deciding what we did with it. And later on, probably not until about 1943, my store of explosive was… disappeared in the school holidays and this came about, I learned ten or twenty years later from my mother, because I had told my father where I hid it and he had phoned the headmaster and said where I hid it. And so next term I went there and it just wasn’t there and of course I couldn’t complain and the headmaster never tackled me about it but I had no more big bangs. But I didn’t think much of my father, but of course it was normally protective, thinking I might blow myself up. And his brother, Cuthbert Swithinbank, had been an ordnance, a gunnery officer in the First World War and subsequently and I made my own mortar to fire projectiles across the recreation ground next door. And I was careful but he realised I might blow myself up and I think that played a part in my father becoming anxious about my exploits.

*Where did you learn to make the mortar, or did you…?*

[1:28:44]

I had an aluminium pipe, perhaps two inches in diameter, and the front end of incendiary bomb exactly fitted it and burned out incendiary bombs were very common to find in the country, German incendiary bombs, and the whole of the back end had been burnt off but the front end made a very good projectile exactly fitting into this pipe. So I filled the back end of the pipe with gun powder and led quarry fuse from it and having lit the fuse got well clear, because not being proper gun steel it might have exploded and I had no interest in getting hurt, never have, and retired. But obviously for somebody who’d been professionally involved with the gunnery, this was wildly irresponsible and must even be stopped as it was, but it became useful many years later in the Antarctic.
I know that explosions, obviously a lot of boys are interested in explosions, can you remember exactly what you liked about it, about setting off explosives, making mortar...

Well we were in a war and there were bombs going off, not very near us, and in fact in school holidays I had to go home to Maidstone through London during the Blitz and so got used to hearing bombs going off and got out of London as soon as I could. But I suppose one reason was it obviously wasn’t allowed, any sensible schoolteacher would try and stop you doing it, but at first they didn’t even know we had any explosives. But at that time you could go into Blandford, the nearest town, and buy a pound of black gunpowder. Even at the age of fifteen they didn’t bat an eyelid because people made their own shotgun cartridges and they were happy to sell a pound of gunpowder. And so we did that, not too often, but we did that and so we had gunpowder when the gun cotton ran out and made small bombs. One of the bombs that I lived to feel ashamed of was an ink bottle that we filled with black powder, put a length of quarry fuse on it and lit it and threw it into the river, with good reason, we wanted fish for a meal and we had a primus stove. And it duly went off with a sort of whoomp under the water and minutes later a lot of fish on their sides came to the surface of the water. Well it really did hurt our conscience – there were two of us did it – because we only wanted a fish to fry and here, I don’t remember, thirty or forty fishes were floating on the river and we really felt very bad about that. But we were saved by the fact that they had been just stunned and gradually they came back and swam away and we caught one while it was stunned. But that of course would have been potential for severe punishment if we’d been found out.

Massacring a lot of fish. When you say in relation to bombing ‘we’, who are you talking about?

[1:33:24]

Close friends. One of them was called John Tennent, he’s dead now. David Goddard was another. We shared ownership of a canoe I remember. And those were two names I remember who connived in the explosive business.
It may be that all of the boys were doing sort of, breaking the rules and doing naughty things all of the time, but if not, can you say why you think you in particular were attracted to doing things which were against the rules of the school?

It was part of the inferiority complex through being younger than the others and through being a total nobody and one doesn’t like being a nobody. And the other thing I did was smoking and that again was considered great sin. And we… the dormitories in this very grand building in the Dorsetshire countryside – it used to be the home of the Portman family, you know, Portman Place, Portman Square and so on, it’s all the Portman… it was Lord Portman’s home – the dormitories in peacetime were on the top floor, kept out of the way, but in wartime we realised the bombs would come through the roof and we didn’t want to kill all the boys, so the dormitories were all moved to the ground floor. And by that means had at least four feet of different layers of concrete above us, very safe. But the result was we could open the sash windows and climb out and walk away, which when we wanted to smoke we did, because we didn’t want the risk of the smell of smoke in the building. So it was generally just a couple, I don’t remember any names, but we’d climb out of the window at night when we were supposed to be asleep, walk half a mile away and smoke. And we had to buy the cigarettes and I don’t think there was any rules against… I mean there was in the school, but I don’t think in a cigarette shop there were any rules. We smoked Sobranie Black Russian, which were about the most expensive cigarettes you can get and still are, but delicious. I think any smoker would agree that they were delicious, but so expensive that later in life you can’t afford them. But at the rate of one or two or three a term, we could afford them on our pocket money, but you certainly couldn’t afford them if you were a regular smoker. They’re black with a gold, I think a gold filter. And if I’d ever become a, got the habit of smoking I suppose I would, but I couldn’t afford those, so I would have been on to Woodbines or something. But I thought it was silly to get the habit because it cost money. And in the navy cigarettes were very cheap and I remember I smoked when offered a cigarette, but never bought any. And my cousin said you can’t go on like that, you’ve got to give and take, and I said well, I’m going to, I’m only going to take, and the inevitable result which I well understood was that you stopped getting offered cigarettes. Well that was fine by me because I never had any habit forming out of smoking. [pause] I mean you don’t have headphones on so you can’t hear the result.
Yeah. Could I ask you to describe the ground of Bryanston? I know that there was a particular bathing place that was a special place, but if you could perhaps pick a point, maybe standing at the house and then take me on a sort of tour around the grounds?

[1:38:05]

Yes, well the building was on a little hilltop, so that in one direction towards the river it was all down slope and the cricket pitches, tennis courts, rugger grounds, were on the floodplain of the river and got flooded in the flood season and rainy season, and beyond that was the river and on the river were the boathouse, because Bryanston always was and still is great on rowing, everything from single sculls to eights, and fielded several eights. And I was fairly early on in the eights and ended up in the first eight. And quarter of a mile further down river was the bathing place. Now at Bryanston the teachers didn’t want formality, not like Eton, we didn’t wear ties, we didn’t wear this. We had a school uniform and shorts, we had to wear shorts, but it was light blue uniform. But in those days it was very common for males of the species when isolated to all swim naked and that to us was absolutely normal and there were no women who could embarrass us by seeing us because it was all in the Bryanston grounds and the other side of the river were woodlands. Somebody could have sneaked down there but we wouldn’t have cared. So we were all… I was very keen on swimming in the river. You can imagine the horrors of the thought of swimming in the river which was too deep to stand in today, but nobody worried in those days and I was taught lifesaving and got a first class lifesaving certificate from the Royal Lifesaving Society or whatever it’s called. So I learned the techniques of how to handle a drowning man, which I think’s always… I’ve never had to do it, but always useful. I can still remember the technique and that is to hold ‘em on the shoulders and knee them in the balls and they generally let go at that point. [laughs]

And the rest of the grounds? There was the bathing place and then…?

[1:41:20]

Well then you see there was best part of a mile, there was a mile or two. Bryanston, it’s enormous estate, about 300 acres. And Bryanston was… there was a drive to the school, but also a very nice football and cycle path which went close to the river. And so if we were
cycling to Blandford we would go along this cycle path, and woods on either side, glorious freedom so nothing to stop you going into the woods and if it was during a period when you were allowed to be wandering around, that was fine, nobody objected. But also, Bryanston disapproved of corporal punishment at that time and still do. And so they had to think of something to chastise you when you were naughty and the normal thing was to run to the gate at Blandford and back in a certain time. And there was a nice gate with a gatekeeper and you recorded the time you started out from school, the porter’s lodge at the school, and then the gatekeeper would have to record the time you were there, and you had to do this round trip in a certain time. And this was not very strenuous, it was partly running and partly walking, but was a good discipline in that it was no particular fun and if you could avoid being naughty and suffering like that, you did. But I think it was a very good substitute for corporal punishment which Bryanston had never had since we were founded in 1928. It was a progressive school in many ways and that was one. The other thing was staying in to do extra homework for punishment. But no physical chastisement of any kind.

*Can you remember why you took up rowing there?*

[1:34:09]

Oh, I should think the inspiration of a particularly keen rowing master probably. And I was always fit and looked fit and a great many of us did take up rowing. And as an alternative to rugger I do have a reason and that is that in Hill Place School we played rugger and I didn’t like having my ears roughed up at all, and of course nowadays in lots of professional rugger they have some sort of ear protection. But we had nothing and I didn’t like the roughness of the scrum, and I was always in the scrum. And so I had a thing against rugger when I went to Bryanston and you had to do something so many afternoons a week. So rowing was greatly preferable and I came to really enjoy the rowing and enjoy the swimming. And then this one day a week you had to do something which was called pioneering, which really was public service and it was in the public service that I learnt to do plane tabling and made a plane table of the vegetable garden. But maintaining the path to Blandford was another thing which people did on their one day a week of public service. Or in the wartime digging the vegetable gardens. Any public spirited thing that was wanted was an afternoon a week and you, I think it was a jolly good thing, very good, we all have happy memories of what we did
because it was always for the public good. I don’t remember other things. I do remember some digging for vegetables. ‘Dig for Victory’ was the slogan at the time.

You say that you ended up enjoying rowing – can you say in particular what you enjoyed about it?

[1:46:39]

Well, social aspect of rowing, which meant that here you were, eight people who had to do exactly the same thing at exactly the same time if you were going to be any good. So it’s a good sort of discipline in realising that you cannot go your own way. I mean the famous quote – I forget where it came from – it was somebody looking at a very good rowing crew said, ‘All rowed fast but none so fast as he’. Well of course that just wouldn’t work at all. And I was very physically fit and so I was often in the engine room of the eight which would be place five or six - five, six or seven - and stroke on other occasions. But this carried on into university where I rowed and I was in the first eight in two out of my three years, I think, in Oxford. And again, you made friends, some of whom you kept for life in rowing and I suppose that applies to any sport really. And I just enjoyed it. I enjoyed feeling fit and never had any illness apart from normal childhood things; measles and chicken pox and mumps, which you’re not allowed to get nowadays, but we all had ‘em in school.

Could I ask you to do two things regarding the surveying? The first to tell me how you came to learn how to do it and…

To do what?

The plane table surveying.

Oh yeah.

And then, after you’ve done that, could I ask you to describe in quite a lot of detail how you surveyed that particular vegetable garden that you write about and that you’ve talked about here. Even if it seems like you’re going into ridiculous amounts of detail, it won’t be. I’d
like to know the exact process and the marking out, the exact physical procedure as you remember it in as much detail as you can. But first of all, how did you learn to do it?

[1:49:28]

I think a particular master, who was a good friend, said would you like to learn how to do it. And plane table surveying you can learn in an afternoon if you’re attentive. And so in the vegetable garden I measured a baseline with a tape measure. I suppose I, from memory it might be thirty yards long, and then put I think bamboo garden stakes in all the corners that I needed to map, and then took angles to them. Well I suppose I… yes, I took angles to them and then moved to the other end of the baseline and took angles to the same bamboos. And then between the fixed points you sketch.

And do you remember how you recorded and where you recorded the measurements or any map that you produced?

Well I mean on a plane table you produce a square…

On the square, on the paper on there.

On drawing paper.

Yes. Did you reproduce that or that was the final…

No, I think the powers that be were happy with that. They could see that I’d done it carefully and it was sufficiently accurate for the purpose.

Can you remember why you volunteered to do it or were you just taught to do it?

I was just intrigued, intrigued by the simplicity of the method and possibly I was thinking, knowing that explorers did make plane table maps.

A good point then to ask what you were reading at this time?
You mean in my off time?

_Mm._

I don’t remember much but it probably was, probably was continuation of my mother reading adventure stories. But I don’t remember doing much reading in school. We were too busy in classes and I was bored and having fun.

_So from where would you have learnt that plane table surveying was involved in exploration and adventure? You'd known for a while or…?_

Yes. A good question. You’re mapping unexplored country and this was a common method of doing it. Of course a much different scale than a vegetable garden, but the principle’s exactly the same. You’ve got to sight on markers from one place and then move to the other end of the baseline and sight on the same things again. Well in geographical plane tabling, your baseline could be a mile or two long and then you were intersecting mountain peaks from both ends. And the length of the baseline you measured with a chain or tape measure. I remember using a chain. You just do one length and put in a marker and then moved on, and that was normal. And then at some stage later, I think while I was still in Bryanston, I found a copy of the Royal Geographical Society’s _Hints to Travellers_ – have you ever seen that book?

_No._

It’s in two volumes. Wonderful, because one volume is entirely about surveying of different kinds. Small, they’re pocket books that you took into the field and did everything up to astronomy. I don’t think stars probably, but sun, all done by a professional, originally I think Arthur Hinks who was the Secretary of the RGS, and then went on to Alfred Stephenson who was instructor in a survey, but I think it was Hinks who wrote this _Hints to Travellers_. And priceless book, it’s never been reproduced and is a rarity now because it’s so useful. The
survey volume is a teach yourself surveying volume, but very, very well written. And the other volume is about surviving in different environments, starting with the camping equipment, travelling equipment, dog sledges, hiring native porters in Africa, first aid, travel sickness, injuries, all those things. A wonderful compressed manual and during the period, as soon as it was written, every traveller off the beaten track took a copy with him into the field. If you were not surveying you didn’t need volume two, but volume one, so the dog sledging came into it, how to position your dogs relative to the sledge, what kind of dog harness, what kind of tents and what kind of sleeping bag, what kind of cookers, everything you needed for camping. And what was wonderful was that it was a teach yourself book.

*You say that you think you probably came across that book while at Bryanston?*

I think I probably did, towards the end of my time, yes.

*Do you remember the first time you used the book either to plan for a field trip or you just took the book with you on a field trip? It’s quite a specific memory, I don’t…*

[1:57:04]

Not at Bryanston, not until I was first year at Oxford and joined the Exploration Club pretty rapidly, because again, it involved travel to exotic places. Oxford and Cambridge had Exploration Clubs early on and a lot of other universities started them up later. And so I quickly sought any - but this is moving on to college – any opportunity for travel.

*Could I now ask you about your memories of the effects of war? So can I first of all ask you whether you can describe the sights and sounds and possibly smells of war that you witnessed from Bryanston and from your family home when you presumably went home on holidays and that sort of thing?*

[1:58:11]

Well at Bryanston we had a few bombs dropped on the playing fields but at the time we didn’t know anything about it because it was I suppose more than half a mile away and they were small, hundred pound bombs and made small craters and I think nearly always it was
German bombers who were attacked by British fighters and wanted to get the hell out and they dropped the bombs in order to lighten their load. I mean the school, if they’d targeted it, it was the most wonderful target to damage, but it never was. Of course we had extremely good blackout during the war with people going round to see if there was any crack of light coming out, to prevent anything happening. So while at Bryanston, no. We read about bombing Coventry and so on in the newspapers. But then in Maidstone, in our house there, we… the German, in 1940 and ’41 there were German bombers coming over every night and we went to the shelter that my mother made in the garden, which was the swimming pool, and there was a bigger danger from shrapnel from anti-aircraft guns than there was… [phone ringing]

[end of track 1]
Where were we?

*You were describing the sights and sounds of war from the point of view of your family home and were just saying that in fact the greatest threat to you was from shrapnel from anti-aircraft guns rather than bombs.*

Yes. That was falling thick and fast during air raids. You could hear *phut*, a piece coming down in the garden, *phut*. And that could have severely injured your head, depending on the size, whether it would break your skull I don’t know, but it was a nasty thought. So we walked to the air raid shelter carrying big volumes of *Punch*. My father had bound volumes of *Punch* which were this thick and we walked to the shelter every night with these on our heads. Of course in the morning the bombs had all gone away so it was alright.

*Can you remember how you felt about the, presumably the sounds, but also the sights of the bombing and attempts to shoot the planes down?*

Well it was so pervading at the time, both in the news and in whatever news you heard, I mean it was just part of life at the time, everybody had to live with bombing. Of course London, they really suffered. [clears throat] Excuse me. Can you cut out coughs later?

*Yeah.*

And going through London on the way, beginning of term and end of term, I saw bombed out bits of London so it was very much everyday sort of thing you had to cope with. But we were never really in danger in Kent except by accidental bombing and… but also incendiaries. If an incendiary had landed on your house you were in a bad way. But they were scattered few and far between. The German bombers were not mad keen on what they were doing because we were shooting down significant numbers of them and the pilots got younger and younger and down to sixteen years of age and they were frankly terrified. And one thing that sticks in my memory is a formation – I forget how many – twelve or fifteen bombers in formation heading for London in daylight, all maintaining formation, did 180 degrees turn to go home. Well, the only reason could have been that they were scared of...
getting killed and how they handled… well they dropped the bombs in open country to lighten themselves, but that did wonders for our morale because we could see their heart wasn’t in it.

*Do you remember what you felt about seeing a lot of aircraft in the sky? You said that you probably read* Teach Yourself to Fly when you were at Bryanston, *because I think you said fourteen?*

Yes, yes.

*So I wonder what memories you have of seeing flight, seeing…*

[0:03:51]

Oh, always longed to fly, but then this is part of human nature. I mean you envy the birds, but I wasn’t thinking about the birds, but I always loved the thought of having a skill to learn how to fly and that was triggered at Bryanston. We, a lot of us were encouraged to join the Air Training Corps. I mean we didn’t have an Officers’ Training Corps there, we had an Air Training Corps, and I don’t think we had the marine equivalent, so we joined the Air Training Corps and the forces who needed recruits from the Air Training Corps did kindnesses for us which greatly inspired us, such as taking us for a flight in an aeroplane. I remember my first… my first flight was my mother had taken me to Sir Alan Cobham’s Flying Circus in Kent and went up in a biplane for five shillings, my mother and both my sister and me. I remember being scared stiff when he banked to turn and I don’t remember being strapped in at all, and possibly in the flying circus they didn’t strap people in. Of course, subsequent generations you always did. But this was at Bryanston in a Lysander and the pilot let each of us have a go and we saw how essentially easy it was to control the aeroplane. I mean anybody can fly an aeroplane, it’s the landing that’s difficult and tricky and potentially dangerous if you don’t do it properly, but all the rest is easy. So that inspired me and I wanted to join the Royal Air Force and get to shooting down as many Germans as I could. But I was not old enough. They were not taking people until aged eighteen and a half and I feared that the war might be finished before I got to eighteen and a half, so I discovered the navy would take people at seventeen and a quarter, so I volunteered for the navy. And so in my fourth or fifth year at Bryanston, 1944, after the spring term in 1944, and I’d made all
the moves before and been accepted when I was age fifteen, that is interviews with the navy and it was when I got to the minimum age that I chose to leave Bryanston. I’m sure my parents were not particularly happy but I was a rebellious kind and said I’m going to join up. I don’t think any parents were pleased about their children joining up because they might be killed.

*Just on that point then, can you remember what your parents’ attitude to the war was, the morality of it, the politics of it?*

No I don’t. I think we went along with the prevailing view that the Germans were beastly, they were aggressors, they would like to take over our country and we were not going to let ‘em. I think that was the general feeling that everybody had.

*I’m interested in those, the two flights that you’ve mentioned and I would like to ask you to describe each in more detail. The Flying Circus flight in the biplane, that was the first ever time you’d been in a plane?*

Yes.

*Could you describe as much as you can about that in terms of the view from the plane, the plane itself, your experience of it, your feelings?*

[0:08:18]

This was Sir Alan Cobham’s Flying Circus, was moving around hiring grass fields, always landing on grass fields, no runways or anything, in different parts of the country to earn money. And they did some aerobatics and as a sideshow took people up for five shillings. It was two open cockpits - I mean having flown an American Stearman later, it might have been that, but probably was British – two open cockpits with the pilot in one and passengers in the other. I seem to remember passengers together in the other, rather crowded sort of… and I don’t remember being strapped in and I think it’s quite probable we weren’t. In fact, it was only later that I became conscious of seatbelts. You know, I was about the first person in Britain to have a seatbelt in my car. It just wasn’t done when I bought my first car in 1953, nobody had seatbelts. And having become conscious of the hazards on the road, I
wrote to the AA and said can you recommend a manufacturer of seatbelts for the car and they said no, we don’t know of any, you could go to aircraft manufacturers. Well I knew that would be far too expensive because everything to do with aeroplanes is expensive. So I made my own – this is 1953 – out of army webbing belting, which is very strong stuff, and I always wore it. And I remember my sister saw this and said of course we don’t drive fast. Well we now know that you can easily enough kill yourself at thirty miles an hour.

*Why do you think that at that stage you were more conscious of the danger than the sort of prevailing culture then?*

[0:10:49]

I argued simply that it’s absurd to fuss about a seatbelt in a light aircraft. You’re going down a runway with nothing to hit, probably a hundred yards’ grass either side of you, and here on the road you are crossing at a meeting speed of more than a hundred miles an hour, passing speed of more than a hundred miles an hour a foot or two from somebody coming the other direction. And that was just my own observation, that it’s far more likely to kill you than in an aeroplane.

*Thank you. Going back to the biplane ride, can you remember your view from the cockpit of the ground?*

Yes, I do and we circled round the… I remember the field pattern and I suppose we didn’t fly high, a thousand feet or something, but I remember shrieking when we banked because I’d not yet absorbed the fact that in order to turn the corner you did bank in an aeroplane. But I thoroughly enjoyed it, particularly after we got on the ground again. So looking back on it, it was great fun. I’m sure that made a big impression. But the other impression, as I told you, was flying a Lysander.

*Yes. Could you just now describe that in as much detail as you can, especially sort of what you liked about it and your experience of sort of a new point of view, you know, on the world.*

[0:12:33]
Well the world looks from above much as you would expect it to look so I don’t remember seeing anything special about that, it looks just as it would look when you climb away from the ground. And this air experience as it is called, for the Air Training Corps, that was a very common and obviously very productive thing in terms of getting people to join the Air Force, because we each had a turn and there was a little logbook you were given as a member of the Air Training Corps, so that if you had civil flights you wrote what kind of aircraft, what duration and then signed by the pilot in command. This is exactly the same as what you do later as a private pilot, but this was a little one. And having done that first flight we didn’t have occasion or forgot to get the pilot to sign it, so I signed it and wrote in the remarks column, ‘A born flyer’.

[laughs] Do you know, can you remember where you went, where you flew from?

Yes, this was from an airfield, not Tarrant Rushton, I flew later from Tarrant Rushton, which was a big D-Day base of gliders and Halifax and Lancaster bombers towing the gliders, and I flew in a glider later, a D-Day glider while they were just training in Dorset. So we would have flown very locally from whatever airfield we were operating from and I forget where it was. But the whole thing was a great thrill, yes.

The speed or the view, what in particular did you like?

Oh, the fact that you were flying like a bird and you could go where you liked by a simple lever.

And they allowed you to use the stick…

Yeah.

…on the Lysander?

That was the thing, they showed you how easy it was to climb, dive, turn and so on. And it is, very easy if you don’t want to do it precisely as you are more trained to do when you’re having any training later. But the fact is, anybody can handle an aeroplane in the air and it’s very easy.
Can you remember what you did, did you sort of fly straight and turn left or did you, you know, turn right round or... can you remember what you did when you were given the stick?

Yes, turns, partly rudder and partly stick although actually you can do without the rudder because an aeroplane will turn easily, if you just bank it, it’ll turn in a circle. And you can, you’re looking at the horizon ahead and you can tell if you’re going down or up because of the position of the nose on the horizon, and you can tell your bank angle by looking at the horizon. So that’s... sort of thing I hope every child does at some time. But it made an impression on me, certainly. And then later, it must have been early ’44 or late 1943, again as part of the Air Training Corps, we were given a flight in a Hamilcar glider and that was the largest plywood aircraft ever built, apart from Howard Hughes’s Spruce Goose flying boat, built entirely of plywood and two pilots sitting above the… it had a front door, which the tank would drive out of. It was not a troop carrier, it was a tank carrier and there was a tank inside weighing ten tons and we, for safety were put inside the tank looking through the slit at the front, but there was a window at the front of the… in the front end of the plywood structure and so we could see some of what was happening through this slit. And I remember there was a soldier with us. There were two of us in the tank and the soldier, who was probably the tank driver. He said, well seeing that we were nervous he said, well you’ve got nothing to worry about because if we crash we’ll just roll out through the plywood in front. And so we weren’t worried until the pilots up above, two pilots up above us pulled the lever and disconnected and at that point, in order to fly you have to go very steeply because heavy load, ten tons in this thing, and if you didn’t go steeply you would stall and crash. So as soon as you were released you went into a steep dive, heading straight for the ground which was rather frightening because through the front window we could see a patch of grass and the same patch of grass we were heading straight at. And what seemed like the last moment, and it must have been the last moment, he very quickly flared out, as we say, and touched down very quickly and he did it very well and effectively, but I could see a lot of judgement was required. I mean you always do require judgement in landing a plane, but most planes don’t stall out as soon as you begin to round out as those overloaded things did. Anyway, that was deadly secret, we were sworn to secrecy, and it was actually a surprise to the Germans when tanks started raining from the sky near Caen, they were expecting troop carrying gliders, but when tanks came out of gliders they were rather amazed.
Could you say what else the Air Training Corps involved in terms of its training? You had these flights, presumably to sort of...

Inspire us.

Yes. But what else were you taught?

[0:19:58]

I forget, but I probably described it in my family wartime memoirs, which you’ve read. Navigation would have been very important. The formalities and the rank structure in the… and discipline. But… aircraft recognition, that was a big deal at the time, recognising every aircraft because it was very necessary to know whether you had an enemy approaching you or a friend. And we were all very good at that during the war and just a glance at an aeroplane, you knew whether it was friend or foe.

Even just the silhouette rather than the markings?

Yes. Now that we were taught particularly in the ATC, but everybody learned that because it was vital aspect of survival to know whether somebody flying around was likely to attack you.

Do you remember any science teaching at Bryanston?

[0:21:27]

Yes, I was good at physics and geology. Actually there were no formal geology lessons, but there was a master who was particularly keen on geology and I think he coached one or two of us privately just because we wanted to have… I mean we were not so pressured that we didn’t have time to learn other things, but I enjoyed physics very much and I got the school certificate in physics. Physics and maths, French. I think I probably failed with Latin, but I got six, six subjects that I got credit in school certificate, which I suppose is O level or something.
Can you remember any particular science lessons?

I remember a Wimshurst machine, that is a thing which generates a colossal voltage and arcs across between two electrodes, which is pretty alarming, or it’s essentially lightning, and it’s teaching you how you can generate an enormous voltage with very little current and so it means you’re learning about the difference between voltage and current. And I knew what amps were and so on. And we did experiments with electrical things and resistance bridges, so on, and lights and measuring volts and amps and ohms.

Was there a particular science teacher or several?

[0:23:25]

There was a particular science teacher. I think that probably was Eric Attock, who nearly ruined my life, totally inadvertently out of the goodness of his heart. He was also careers master and so each had an interview to discuss careers. In fact we had a psychologist from outside come in to visit the school to find out your aptitude for things and I didn’t seem to have much aptitude and Eric Attock, who was a very nice man, doing his best, advised me that I probably shouldn’t go to university because I probably wasn’t up to it. Well, that story has made me warn every child I’ve ever met since that he must never accept any negative advice, only positive advice, ignore all negative advice. This chap said he doubted I could maintain interest in one subject for three years and I’ve been on the same subject for sixty years without losing interest.

What methods was the psychologist using to assess your attitude?

Normal external door lock, ones this shape you’d have in a garden shed, you had to take it to pieces and then put it together again and even today I find that difficult, takes me a long time.

And that was it? That was his…

That’s the one I remember.

Was there any geography teaching?
Yes, and it was good. Geography teaching at Bryanston was good. I think it was learning how different other countries were that was inspiring and fitted with my ambitions to explore. But I was good at geography and in fact in our last year at Bryanston we had to do an individual project and my project was – I’m trying to remember what country it was, I think it may have been Peru – was to write a long essay, do the research all on my own, and then write a long essay about Peru. And I wrote to the Peruvian Embassy – this is during the war – and said I need to find as much as I can about Peru, and they responded very helpfully. And this was quite a competent for age sixteen essay that I wrote. I think I’ve long since lost it, but I enjoyed the research, the literature research, and reproducing it in a readable format.

So that was research that I remember and I think it must be, for the time, rather unusually thorough, which I have been ever since in what I’ve done. And it was because we were encouraged to be original and not to take things out of a textbook. And certainly in Oxford when I was reading geography you would have felt very guilty using a textbook. We didn’t use any textbooks, all the teaching geography at Oxford was on original scientific papers, so that we had to do the comparison and evaluation of what we were reading ourselves. I think that’s a strong point about the English university system actually, that you are not… and you are more in America learning to reproduce facts that you’ve got out of a textbook. Well, in my time at Oxford I did sneak a look at textbooks, particularly just before exams, to make sure I had some facts at my fingertips, but all the training of weekly essay writing is about critical evaluation of what you’ve been reading, and so you – you probably had the same thing – but given contradictory angles on global problems and it’s no good just quoting them, you’ve got to evaluate them, say which sounded better and why. That’s one of the great strengths of the university system here. And later on, much later, when we had PhD students, well initially MPhil students come into the Scott Polar, we noticed about the Americans, they came with glowing references of their academic prowess and on the MPhil programme which is still going on, we have people from all over the world interested in the polar region, they’re set an assignment and the teacher puts out a number of different references and gives them references to look up and find and write a critical evaluation of the subject of the essay. Well it’s exactly the same as I did in school, but for the Americans, no, they just give you a précis of what the textbook says or what the paper says and no kind of evaluation of who’s
right and who’s wrong. And we had Americans come who fell flat on their face and went home because they couldn’t cope with this although they were graduates of a Junior College.

Yes.

So I count Bryanston as being a very important influence in doing individual research.

*The Peruvian essay for example, was that physical or human geography or both?*

Both. When we get on to university expeditions, I wrote a very, a very good - I think this is it – a very good paper in my last year in Oxford as a result of a summer expedition to the Gambia and that was a thorough analysis of everything, starting as a textbook would with climate and ethnology and so on and government, agriculture, everything. And that, I think my tutor said was the highest mark in my final exams was for that, which was characteristic that it was entirely my own work, initiative, analysis and it was a result of the second undergraduate expedition. First one was to Iceland, second one to the Gambia.

*Yes, I’ve got this down to cover when we get to Oxford. We’re nearly at the point where we’re going to leave Bryanston behind, but could I just ask about relations with your family while there. In other words, how often did you go home?*

At Bryanston?

Yes.

Only during the school holidays.

*Right.*

[0:32:54]

We were there the whole time and I so loved Bryanston that I normally tried to go back a day early and stay a day after the end of term, which was the maximum allowed. But this was not necessarily through academic enthusiasm, it was through enthusiasm to get back to the
freedom of 300 acres to go where you want. And so I did that, but my mother might have been down at half term once, but normally she was too busy in the garden to come.

**Did you correspond with your mother or your sister?**

Yes, corresponded and she used to send food parcels because I probably – I don’t remember dishonestly – but probably described the school food in not very flattering terms and she would send food parcels as you would to a prisoner of war, and this was always a great bonus. But she was making her own food and she had goats and she was making butter and cheese and so she could send them. Food was rationed, but fruit of course, it was all home-grown. But I remember getting food parcels from home and that was a great privilege.

**How did you feel about your sister going to Canada?**

[0:34:35]

Her school, she was Benenden School, which I think Princess Anne went to later, in Kent and the whole school initially was evacuated to the West Country as a lot of boarding schools in Kent were, to get them away from the bombers. And then I suppose even the West Country, Bristol was being bombed and more dangerous, they, the school encouraged people to move to Canada and Canada was being very generous about that. And so I didn’t know much about it at the time and sort of departure dates and shipping and everything was dead secret and she went on a liner with all the Benenden people whose parents wanted them to go to Canada, you didn’t have to, and it wasn’t until twenty years later that I learned that ships in the same convoy were, with children on board, were sunk.

**You decided not to go – can you remember why?**

I decided not to go because I wanted to as soon as possible start killing Germans who were wanting to invade my country, which I was pretty unhappy about.

**Before we leave Bryanston then, could you just say anything else about the teaching of science that you think you can remember. You said that you thought you were good at physics. I don’t know if you can remember why you thought you were good at it, in other
words how you knew you were good at it, and if you can remember any other teaching or lessons apart from the ones you’ve already described?

[0:36:46]

I wasn’t good at history but I always regretted it and I’m sure that was, I blame the teachers for not making it interesting enough. I wasn’t good at Latin because I probably didn’t work hard enough. I wasn’t good at chemistry. What was I good… well, I mean I got six credits at school certificate so I must have been good at something, French was one, geology, physics, English language probably. I’ve still got the certificate, I can find out. So yes, that’s what I did. But I was undistinguished, academically undistinguished and it didn’t bother me because I didn’t know that I was going into research.

In the geography teaching, which you said was good, was there any teaching of fieldwork, how to do it?

Quite probably it was a geography teacher that helped me with the plane table, because we must have covered survey in geography classes and yes, how you make a map must have been geography lessons, which is pretty vital. And so, since everybody including what I’d been read to from very early on, Scott and Shackleton and Livingstone had to make their own maps as they went along. This was an obvious thing that you had to do if you wanted to be an explorer. But you can never tell anybody in school, particularly careers master, that you wanted to be an explorer because it would have been like a damp rag, he would have replied well it’s all been done, you must do something else. And of course that I’ve known is nonsense ever since. The character of exploration changes, but essentially the chemist looking into the structure of an atom is exploring, all of life, all of science is exploring and it’s just got more and more sophisticated and need better and better training and I couldn’t possibly earn a living in glaciology today, I just don’t have the background. But I have done things which nobody else has done and that white book just to the right of the other ones… no, very close. Actually all white and just to the right of Forty Years on Ice, between that and… yeah, that one. That – pull that out – I think that is, yes, Satellite Image Atlas of Glaciers, which is the first book I ever had with my name on the spine. That was a mini textbook of glaciology connected with interpreting satellite pictures and that was a thing which was a great privilege for me, but they couldn’t find anybody in the whole of the United
States who they thought competent to write that, but they knew I had a lot of fieldwork and obviously looking at the countryside from above, if you’ve been travelling in that sort of country you interpret it very easily. And if you haven’t ever travelled in the Antarctic it all looks very strange. So I did that and I think it was a very competent piece of work and a high-powered glaciologist wrote to me many years later and said that he’d put his students on to reading that as soon as they began in glaciology because it was so basic for Antarctic glaciology. But it was a great privilege because they gave me all these pictures which at the time were the top class of satellite pictures of the Antarctic, for nothing, free of charge, I mean thousands of dollars’ worth of them and said well you can have five hundred words to describe what you see in each picture. And that was a wonderful privilege and I had total freedom to choose what to say and I threw in little bits of history, saying Scott travelled here and Amundsen travelled here. And in the course of the editing it I was allowed to add some colour, because colour was only just beginning at the time in satellite photographs. And then it was a sort of time line point in that we could list every satellite picture ever taken up to that time, which is the second half of that book.

*This is something I’m definitely going to ask you about. This is late 1980s, you’re producing this. Looks like from the date on there.*

I think just after I retired, but I was doing it at weekends because in the Antarctic Survey I was Head of Earth Sciences, which was a very time-consuming job, and rather frustrated that in the last few years I was not doing any research. So I came in at weekends and wrote that.

*Yes.*

And it was published shortly after I retired.

*Okay, could you tell me, you’ve told me why you applied to join the navy rather than the Air Force, because you thought you could get to war quicker by going for the navy, could you please describe what was involved in your training as part of the navy Y scheme?*

[0:43:53]
Well the Y scheme was a scheme for what they thought, people they thought might be eventually officer material and we were interviewed and tested in some ways in 1943 and so you were signed on before you joined. And it was particularly sold by the navy in public schools or offered and you faced a frightening board of senior naval officers cross-examine you about everything they could think of to bring you out and I passed, but it was the understanding that everybody begins on the ground floor as an ordinary seaman and with ordinary seaman you are thrown together with all classes of society and if that is not to your liking it would not be a good thing, because you’ve got to begin on the ground floor in order to understand what life is like at the tough end. And I didn’t mind that and I never minded naval discipline because I could always understand the reason for it. And even when you were made to do unpleasant things by not particularly nice officers, I never really… I never really worried about it because I realised that it would only go on for a limited time, that you…

What sort of things do you mean by unpleasant things?

What do I mean? I remember the nastiest job – well I’m talking about after, during training, was when somebody went up the mast, was told to paint the mast, and he painted from the ladder that goes up there, he painted the mast, the side of the mast he was on, but didn’t do the far side. The next day I was told to do the far side, which meant potentially leaning against wet paint. I felt very sour about that, but it had to be done, so I did it. And I think you get good marks for that sort of thing because what you get bad marks for is grumbling or saying, oh I don’t think I can do that. Well, when you’re a junior rank you damn well do what you’re told to do without questioning, as in any military service. You are being trained, well to put it crudely, as cannon fodder and it’s necessary for the teamwork to do what you’re told.

Could you describe, I think the first part of your training was at the Butlin’s Holiday Camp in Skegness and there were boats on the swimming pools.

Yeah, that…

Could you describe the appearance of the place and what was involved in training there?
Yes I can. Well, the chalets, that was Billy Butlin’s first holiday camp and the chalets were about the size of this room – they were called chalets – where in peacetime families would be housed and in wartime there were four or six beds in a chalet but they were still separate buildings, a few yards away from the next one. There were rows and rows, like beach huts. But all the public buildings for teaching were in what was the dancehall and various other classrooms, but there was a lot of practical stuff, that is square-bashing and doing everything on the parade ground. And yes, the handling of boats – whalers and cutters were the two kinds – and we had oars with holes in them so that it was, although you weren’t moving, it was about the right amount of effort to pull it through the water and that meant rowing in time with your colleagues, which having rowed in school was no surprise to me. And that I was quite happy about. And then seamanship classes; knots, how to tie knots, navigation, gunnery. All that was begun there, only the beginnings because I think I was only six weeks there before going on another level, which was HMS Excalibur in Alsager in the potteries country, and that was the next stage of training in which I think by that time we were probably separated, the Y scheme were separated. I’m not sure about that, but we were doing subjects beyond tying knots and seamanship. And I was not very good at the mathematical part of navigation and after the length of the course, which I forget, months, I failed which meant that under normal circumstances I’d be consigned to the lower deck for life, but it’s my first experience of working of the old boy network, the panel of senior officers that failed me, one of them had worked and admired my gunnery officer uncle and said I had a great respect for your uncle and because of that I want to give you a second chance. And so I was given a second chance and did alright the second time.

Could you say in as much detail as you can remember, how you were taught navigation and what pieces of equipment you used, how things were recorded, where you practised, that sort of thing, the practice of doing it?

In that camp, HMS Excalibur, it was all, it was all classroom work with no practical. But at the same time we were learning Morse, we were learning semaphore, flags, seamanship,
navigation, all these subjects. But the navigation was all paperwork as far as I remember. It was not until we got on to our ships later that we had to actually navigate.

*And how was it taught on paper?*

Oh, plot a course from A to B or plot a course to keep clear of shoals. Why did you plot a course like this, why did you turn a corner here.

*So in front of you on your desk you’d have?*

Probably a chart and you describe how you would fix your position, having been taught that what you do is simply take compass angles to at least three points on the coastline, which you’ve got to recognise from the map. And that produces in theory a place where they all cross, but in practice it’s called a cocked hat, which is a triangle of error, you’re likely to be somewhere in that triangle of error due to the fact that you’re moving between the timing you take the first bearing, and the second and the third. Of course on the chart, playing games on the chart, you’re not actually moving. But that sort of thing, coastal navigation. I think we did the beginnings of navigation by the sun. But dead reckoning, if you travel at so many knots for so much time and you are being affected by a sea current coming from a particular angle pushing you off your intended track meanwhile, where do you land up? Things like that.

*Could you say more about dead reckoning and what that involves in practice?*

[0:54:34]

Dead reckoning is very simple. It’s simply projecting where you will get to if you continue on a certain course at a certain speed. Now, with no winds or currents there’s no other problem, but there always are winds or currents pushing you off and so you’ve got to calculate what they’re doing to you and how do you do that. The crab angle between different fixes in order to keep yourself on the track that you’re trying to keep on and then fixing as frequently as possible. And when I got to minesweeping much later, we had an incredibly crude but effective method, which was a hundred miles of piano wire on a big reel on the back of the ship which we started close to the coast where we had a good fix, dropped
a hunk of concrete with the end of the wire attached to it and then started steaming and this reel was unwinding itself with metres like a cycle meter on, tell you how far you’d been. That only gave you one dimension, distance from the start, it didn’t tell you where they’d been pushed sideways. But there was nothing much you could do about that if you had not established something about the currents before you started going out to sea. But navigation was very crude because we were, until I was minesweeping we were essentially without any radar. Although on the cruisers they probably had primitive radar, but I was not involved with it.

*And then could you talk about your first experience of - you were still being trained I think at this point – but of working on a boat that was actually afloat, you know. Because some of these names, HMS, are actual buildings aren’t they, on land?*

Yes.

*But your first sort of travel on sea as a navy training.*

[0:57:20]

The first afloat was HMS Dauntless which was *the* training cruiser and we went out in the North Sea and we had to learn to live on the lower deck and sling our hammocks and secure our hammocks during the day because we slept in the mess room, in other words, the dining room of ordinary seamen. And your hammocks at night were slung over the tables from any hooks you could find, that was a normal thing. But then, cleaning, had to do all the domestic cleaning work: loos and all, and it was all inspected to make sure you did it properly. Scrubbing decks without shoes on in the North Sea in winter with the fire hoses being played on to the decks to give you water to scrub with. The Petty Officers who were spraying with the fire hose had rubber boots on but we had to be barefoot. Well, it wasn’t very nice, but it stopped before we actually got frostbite. [laughs] It was just part of the, part… to test whether you could do what you’re told without grumbling, which is an essential thing and you’d never get promoted to an officer if you hadn’t shown that you can do what you’re told to do without grumbling.

*What sort of relations did you form with other trainees?*
Pretty transitory. We were all jammed together and so you knew everybody. Well no, I think in the navy it was exactly the same as on an Antarctic expedition that the enterprise depends on people getting on, regardless of whether or not your fellows are people you ever would have chosen to be friends. That never occurs to you and if it does you’d better dismiss it pretty fast because you’re in a team and if there are people who if you had a chance to think about it would like in a team and others you wouldn’t like, but it doesn’t make any difference to the way you behave with them and later in Antarctic expeditions people say well, of the five nationalities you had on your first expedition, which did you like best. Well, really didn’t think of it, you were a team, you had a job to do and whether you might have chosen somebody as a friend was irrelevant because you were a team.

In that case, in what ways does that affect the closeness of friendships that you do make in those situations?

[1:01:01]

Friendships you make in those situations are almost entirely through working together. I mean that’s why people so often marry one of the girls in the office because they’re working together, see each other every day. And friendships I suppose are both in the navy and on expedition are fairly shallow because they mustn’t… they’re nice to have but they don’t control your behaviour in any way and it would probably be a bad thing if they did.

Can you give an example of a kind of control over your behaviour that would be bad then, which would result from having a friendship?

Probably agreeing to rebel about something. It’s easier to rebel if you’ve got somebody agreeing to rebel with you, but in the context, that’s very bad.

Yes, I see. And on this training ship, you were starting to learn presumably navigation in a more practical way?

[1:02:37]
Yes, we were actually on the bridge taking angles with the gyrocompass and actively plotting them on a chart, on a chart table close beside the ship’s navigator’s chart table. And so we were shadowing everything he was doing and he would, from time to time, look at our chart to see whether we’d got things right. But you were taking three point fixtures with coastal features that you’ve got to recognise from the chart, so that involves map reading. And if your triangle of error, the cocked hat, is large, well you’ve done something wrong, probably recognised the wrong place on the coast and you should be caught out at that. And gradually you got things closer and closer to what the professionals were getting.

_Could you describe the look of the gyro… the piece of equipment you mentioned at the start, the look of it and how it was used?_

The gyrocompass mechanism is deep down in any ship and it’s wired to a device on the bridge, at eye height, four feet up, and there it has a readout so effectively that is a compass but it’s not affected by your watch or any local magnetism because it’s all being driven from this gyroscope deep down in the ship. And you have this thing, you move around with a sight and a prism so that you can simultaneously look at a distant position on the coast and read underneath it the precise numbers, the bearing. And so it’s very easy. Your mistake is if you’re not looking at the right place.

Yes. _So you have to, you’d have to have your map, you have to – were you able to have your map and the view of the coast at once or did you have to move between map table to window?_

No, you move from the compass, taking a bearing, 232, and then plotting that on the chart. And in fact you want three bearings in order to get a fix and you plot, put them on a chart with a parallel rule because there’s a compass rose on every chart, usually two or three of them, and you choose the nearest and that’s your baseline to measure angles off because with a Mercator projection they are pretty much the same, but any other projection they can be different because of the projection. Mercator means the distortion is such that it is pretty uniform. And you move the parallel rule – there are two kinds, one is on hinges, moves like that, or like that and the other, which the navy usually prefer, is just a roller, a rule with a roller under each end and you roll from the pencil line you wish to say what direction it is, to the compass rose on the chart and put it going through the middle and read the bearing.
Ah. So you can find the bearing of that line?

Yeah.

Okay, yeah. And then you’d do that three times to fix your position. Now you said that they would check to see whether your triangle of error was small enough to be acceptable, how would they judge how big your triangle of error is, can you describe that to me? How do they see that in front of them? How do they see your error?

Well on a chart of the sort of scale that you’d be using in coastal navigation your triangle of error would be quarter of an inch if you’re good and could be larger if you’re a bit careless.

And is that the difference between where you fixed yourself to be on the map and where you actually are – is that the triangle of error is?

No, the chances are that it’s to do with the movement of the ship between taking each bearing.

Yes, because each one takes some time to do while the ship is moving, I see.

Yeah. So what you do in practice, you may have made no mistake at all in taking your angles, you’ll still get a triangle, so for practical purposes you make a pencil mark at the centre of the triangle and say this is where I am, which is an approximation.

And so is it therefore important to take the three measurements quite quickly so that the…

Yeah. Yes.

…distant, yes.

Quick as possible.
Yeah. Thank you. Could you describe, at one point you say that you actually have experience of surrender, so could you describe the, after you’d finished your training, the sights and sounds of surrendering Germans?

[1:08:43]

That was when I was in HMS Berwick, which was a real live active cruiser, nothing to do with training. But I was a Junior Midshipman then, but between Dauntless and other shore training, we were chosen, if we were chosen, to go for officer training at HMS King Alfred in Hove, Sussex, and that was where all temporary, that is, we were called ‘Hostilities Only’ officers where we were made from ordinary seamen, came in as ordinary seamen with round sailor’s hat on and went out with an officer’s cap on. And that, I forget, that was three months I think, training. And then I joined HMS Berwick, which was a real live cruiser with eight-inch guns and by that time the war was just about ended in Europe, VE Day, and we had the great privilege, as I realise it was great privilege, of going across to Norway a week after the end of the war and going into Trondheim and then Bergen and we were the first allied ship in, which was a great thrill for the Norwegians, a great thrill for us. And the first one, Trondheim, it was on the seventeenth of May which is Norway’s National Day. It was the first National Day they’d had for five years when they were allowed to go wild. And we had boats coming out from the shore and nearly getting swamped with people waving and cheering and they were all dressed in their national uniforms as they do on seventeenth of May. So that was a lovely coincidence and we tied up alongside in Trondheim and we were allowed ashore and we put on a children’s party with swings from the muzzles of the guns and fed the children and gave them all our week’s chocolate ration, and a few of them had never seen chocolate before because they’d been five years under the Germans. And what I remember of that is going ashore, walking ashore, unarmed in my uniform, and finding German soldiers marching the streets with their rifles slung over their shoulders, which seemed rather odd; they were the vanquished and I was representing the victor. But they had given in and they chose or were allowed to keep their rifles, obviously not to use them, and so I as a Midshipman was being saluted by German soldiers in the streets, the Germans with rifles and me with nothing, but you acknowledged the salute in a very proper way. And we went to a few shops, there was very little in the shops, and I was interested in the submarine pens there - I may be mixing up Bergen with Trondheim - but then there were the submarine pens and I walked along towards the submarine pens which had been, had chips out of them
because of the Royal Air Force trying to get at the submarines inside, tremendously thick concrete buildings, flat roof concrete, reinforced. And before I got there I saw a German ship which turned out to be a catapult ship for catapulting small aircraft into the air and I was intrigued with this because here was quite a small ship, low lying, with no visible guns and just this ramp, launching ramp I suppose, fifty yards long or more. And it was obvious that it was for launching aircraft, although there weren’t any aircraft there. And they were tied up alongside, they’d all surrendered and were waiting for orders about being demobilised and going home and what to do with their ship. And so I went on board, nodding, because I didn’t know any German, nodding to the crew, nominally asking for permission to come on their ship, which you would out of courtesy, and I asked to see the captain. And the captain, I was the first allied military he’d met since the end of the war, and he invited me down to his cabin and we were perfectly friendly because the war was over, but he couldn’t speak any English and I couldn’t speak any German, but I noticed that he had *Jane’s Fighting Ships*, which is a big British publication with all the world’s fighting ships in, and so I was turning over the pages with him and we came to the Bismarck which the British had sunk. And I didn’t want to embarrass him so I said, wonderful ship, which it was, wonderful warship. And then we got to HMS Hood, which had been sunk by Bismarck. And he said, wonderful ship. And that sticks in the memory.

*How did you feel when the war ended?*

[1:15:36]

Well, I wasn’t in Piccadilly Circus till VJ Day when everybody went wild and they went wild on VE Day but I wasn’t there. And I would have gone wild if I’d been in London and people marched down the Mall to Buckingham Palace and the King and Queen came out and acknowledged the crowds, just immensely glad to be alive, as were millions of others, it was wonderful. Of course, there were still the Japs to fight, Pacific war was still going on. And I hoped to go to that, I was still on HMS Berwick at the time. And we’d even been told to get white uniforms, tropical naval officers’ uniforms, and I had. But just before leaving Portsmouth they decided that all hostilities-only officers, perhaps the sailors as well, were not to be taken out east and this ship Berwick was to be the first entirely Royal Navy ship, RN, meaning permanent navy, the juniors being all the products of the naval college in Devonport, and we were all off, push off and we felt pretty sour about it because we wanted
to keep on fighting, and had a period at home when the admiralty didn’t know what to do with us. And then there was one thing which was still being done and that was trying new aircraft on an aircraft carrier and joined HMS Pretoria Castle, which was the trials carrier for the Royal Navy at the time where all new aircraft or modified aircraft had to do deck landings on, take-offs and landings. And that was exciting because I enjoyed seeing aeroplanes and it’s quite hair-raising, including for the pilots I may say because you’ve got such a short runway, you’ve got to land exactly in the right place to catch on to the arrester wire and if you don’t they have this safety net which is like a tennis net, comes up in front of you and stops you from going over the front of the ship. And I saw an aircraft go into that and went up on its nose, but it saved the life of the pilot. But it’s a minute fraction of a second, a misjudgement that caused that. So, not easy. And eventually we had three crashes in one day, a memorable day, nobody was killed. But I was watching them because I loved watching the deck landings, but I always put myself in a position where I could duck behind something if the plane disintegrated, which they did, the propeller disintegrated and bits flew over my head, but it took me a fraction of a second to duck down behind… well I’d prepared for it because these things happen. So two I actually saw happen and the third I was having dinner in the evening in the wardroom when there was a pipe on the PA system saying ‘Crash on deck. Crash on deck’. And of course the first person to get up was the doctor, and immediately went, but then the younger folk who liked ogling activity like crashes got up more politely from the wardroom table and went up on deck to see what was happening.

And that was quite a day. I think I was three months on that ship, it was the only day we had three crashes on board, but nobody hurt, luckily. And while on board I witnessed the first jet aircraft landing in the world. The Americans hadn’t done it and we, our flight deck was not long enough to do a first experiment with a jet. It was a Vampire jet with a hook put on for the arrester wire. So they decided that HMS Ocean, which was a proper, well the first jet landing on any aircraft carrier in the world was on HMS Ocean which was built as an aircraft carrier as far as I remember. We were, Pretoria Castle was built for the Union Castle Line run between Liverpool and Cape Town, or Southampton and Cape Town. And as a shortcut in the war they cut off all the upper decks and put a flight deck on the top and control tower at the side of the deck. But we weren’t long enough to risk taking a jet. But we were steaming parallel with HMS Ocean, heading into wind at full speed as you always do when you’re launching aircraft, to reduce the speed of approach and the speed of take-off, and usually try to get thirty or forty knots over the deck, partly by the prevailing wind and partly by heading into it at full speed. So we were parallel with Ocean and this was all announced
ahead of time that it was going to happen. And we saw this Vampire driven by a Lieutenant Commander Brown, make a perfectly successful landing on HMS Ocean and take off later. Well it hit the headlines the next morning because it was a first and the Royal Navy was very proud to have done it before the Americans.

So you saw it take off from the, from HMS Ocean and then did it, what did it...

No, it didn’t land a second time. It landed once as far as I remember, and then went back on land. But the...

Right, okay. So did you see it sort of approaching from the distance somewhere and then it came onto the...

Yeah. And of course like any deck landing you just wanted to make sure they caught hold of the arrester wire. And later I flew, I got a flight from Pretoria Castle in a Firefly, which was, looked roughly like a Hurricane, slightly bigger, and with two, with a long cockpit. The cockpit hood was all one but there were two cockpits for the pilot and observer and I was in the observer’s seat. And we, I forget, I don’t think it was a assisted take-off, I think it was just into a good wind from the back end of the runway and we were safely airborne by the time we got to the front end, and we flew round for a bit and I was chatting on the intercom to the pilot. There were lots of instruments in front of me in the observer’s seat but they were all to do with, they weren’t to do with flying the aeroplane. And then we started the approach to landing and I thought this was hair-raising as I’d seen it was from the deck and the deck looked so incredibly small from above as you were approaching it. But this was training and he approached and made a perfect landing. What I was surprised about is how gentle the deceleration was, I’d expected to be thrown against the front and so I’d either put my hands up or my feet up in front of me to cushion the shock, but in fact I didn’t need to because it was so gentle.

And how did it compare as a flight to the ones you’d had in the training corps?

Oh well this was a warplane so it was faster and more manoeuvrable, much faster.

Can you remember what sort of course you took in the flight?
Oh, gentle turns, that’s all. I didn’t fly it at all, I mean I don’t think there were any controls in the observer’s cockpit.

At one point, I think this was on HMS Berwick, you sailed north and crossed the Arctic Circle. I’ll just ask a question of fact to start with and then ask you to describe. The factual question is, was this the first time you’d seen a kind of Arctic landscape?

[1:36:09]

Yes, going to Spitsbergen was certainly the first time I’d seen any kind of Arctic landscape and I think the purpose was, I mean not everything was explained to very junior officers, to take the Norwegian garrison, which had been on Spitsbergen latterly. I mean the war in Spitsbergen was very interesting because it was a matter of allies and Germans each setting up separate weather stations and then going in and shooting up each other’s weather stations and cat and mouse game. But the Norwegians were there that late in the war and of course, as soon as they are no longer needed, they needed to get home, there were 600 of them and somehow we squeezed them in the ship as I remember. And we were allowed ashore and – well I think we were. Anyway, I thought what a wonderful looking country and I’d love to come back there. And so unconsciously I said to myself, yes. And this is probably why in 1947, I was a first year undergraduate in Oxford, I signed on for Iceland expedition because I liked the look of the Arctic, and I’ve been back to Spitsbergen a number of times since.

When you say that you thought that the landscape the view of Spitsbergen was wonderful…

Yeah.

…can you break that down a bit and say what in particular you liked about this very particular kind of landscape?

[1:28:01]

Ice covered mountains with glaciers flowing down to the sea in between. We must have gone ashore because I remember admiring the people there and considering them pioneers
and how in spite of these surroundings they were behaving like the home it was for them. But I think the time ashore was pretty brief. Yes, so totally snow covered landscape is what we saw and I’d never seen anything like that before. I mean I’d been ski-ing in Switzerland with my family and ski-ing in the Pyrenees, one season in each, so I knew about snow covered mountains, but glaciers I didn’t know anything about and here they were, some of them calving into the sea, others ending on land and in fact right at the end of the valley of the town, Adventdalen, that we… where is a former coalmine, at the head of that valley just a mile or two inland was a glacier flowing into the valley. I don’t think I got up there.

So you were seeing them rather than being able to walk on them or…

No, I didn’t walk on them until Iceland. I mean I’d walked on snow of course in Switzerland. But the first glacier I walked on was in Iceland, 1947.

So the Spitsbergen scene, apart from the visual elements which you’ve described, was there anything else about the environment that you particularly liked in terms of the sort of feel or…

Well you were away from all the rules of civilisation that people had to look after themselves and if you went outside the town you were very much on your own and there were polar bears around. It’s a dangerous place, so you want to demonstrate your independence if you’re there and all of them have to learn how to behave in bad weather, high winds, snow and so on and as you see when you go to Norway at any time, for the locals it’s just life, it’s the everyday thing, it’s no big deal, but for somebody coming from a sheltered life in England it was a big deal to see how unflustered people were in that environment, I mean in Spitsbergen there are shops. I’ve been there a number of times since, but even then there were shops, and a coalmine. It continued for years after the war. It’s discontinued, that particular coalmine, but there’s still coalmines active in Spitsbergen today.

And did you notice any of the particular ways in which the people had coped? In other words, it had become the ordinary, special adoptions to things that were novel for you?

[1:31:41]
Well it was summer so they were not on skis, but no, I think just how ordinary it was for them, that for me it was a big deal because I’d never seen any place like it before, but for them a total adaptation, it was home, and there was a school there. And there was a bar there and shops and everything and it’s all… they were living very matter-of-factly, not thinking about these things.

More generally, the experience of travelling by boat, having the occasional ride on a plane, but mainly travel by boat at this stage, how do you think that that affected you in terms of the way you saw the world, the way you saw yourself, what was the effect of this navy experience do you think on you?

[1:32:48]

Self-reliance, I think, which of course was vital as soon as I got to the Antarctic, well on any expedition firstly, firstly on the ice cap in Iceland and then in the Gambia and then in the Antarctic. Self-reliance, that nobody’s going to help you if you make some stupid mistake and so you try particularly hard not to make any stupid mistake.

How does the self-reliance relate to the idea of being in a team though?

Well, you’re in a team and sometimes a very small team, sometimes two people in a potentially hazardous environment and, okay when you’re two people you are probably looking out for each other, but still there are occasions when you have to work alone and then you just have to think what would happen if I fell over now and broke my leg, have to think of contingencies.

[end of track 2]
Okay, could I start by asking about your arrival at Oxford and what you remember of your sort of first days in your new college?

Pembroke College, Oxford. I had come straight out of the navy, having been in the navy for two and a half years, and was only just released in time for Oxford term and so came up having just shed my uniform a week before. And it was an interesting time because half or more than half of the undergraduates were ex-service people, so we had these two communities: mature ex-service people who had retired from killing Germans and people come straight up from school. And sometimes there was a lack of mixing, but I did make friends with people who had come straight from school, but also with just as many ex-service people and I’ve kept corresponding with one or two for the last sixty years.

As someone then who stood between the two groups, could you talk about how each of them viewed each other; the two communities, the school leavers and the demobilised students?

Yes, well there was upset feelings of course on both sides. The schoolboys feeling a slight inferiority complex in that they didn’t have stories to tell of fighting, and the ex-servicemen are rather looking down on these people who were immature, as we all were before we went into the service. But there were no battles or anything; we were all tolerant of each other because we, both communities were essential parts of the undergraduate body.

Could you comment further on the kinds of maturity that the ex-servicemen felt that they had gained in relation to the people who hadn’t been away? What sorts of maturity did they feel that they had?

[0:02:55]

Self-assurance I think would be the main answer to that, whereas somebody coming up straight from school is a little bit nervous because he doesn’t know what’s involved in university, whereas the ex-service people were used to being plunged into new environments and took it in their stride, they had to in the course of their service, and here plunged into an Oxford college that they didn’t know, they were self-assured.
Thank you. Could you tell me about your first sort of college room, do you remember it well enough to describe your sort of living arrangements?

[0:03:42]

I do. By modern standards they’re luxurious. It was on an old staircase in Pembroke with oak, two doors and the expression when you wanted privacy is ‘to sport your oak’. It means that you close the outside into the staircase oak door as well as your inner door and that indicated you don’t, didn’t want visitors at that time. But a comfortable room about the size of the room you’re in now and a separate bedroom. For bathrooms we were still in the seventeenth century. You had to go down the stairs, across the quad and into a group bathroom and that was… that was hard work in the middle of a cold winter to go out in your pyjamas [laughs] to the bathroom. And nowadays very many colleges are putting in en suite bath and shower. So that was one thing I do remember, having to cross the quad in weather like today, below zero, and… but we took it in our stride because, well you had to, there was no choice and you do in any walk of life, if there’s no choice you get on with it.

Can you remember how you made your room sort of personal to you? Could you tell me what was on the walls for example and that sort of thing?

Difficult to remember what was on the walls. I think I had a noticeboard and I had photographs from the news, people who were in the news. I had rowing photographs because I was rowing right from the first term in Oxford because I’d rowed at Bryanston, been in the first eight, so I was immediately grabbed by Pembroke and put into the First Torpid, which is the spring races, and trained for that and went through the 1947 winter, I think it was, was the coldest winter for many years and the river was frozen and we were all wearing shorts and braving the weather and if the ice had broken up on the river we would go rowing every day.

So you had pictures of rowing on the walls, photographs of people in the news. Can you remember who you might have had on the wall from the news?

[0:06:54]
Probably had Joseph Stalin because he was seen as a hero during the war and we hadn’t yet swallowed the fact that we were now in a cold war. And otherwise beautiful women: Ingrid Bergman I had on the wall. But I think she’s the only woman I can remember on the wall, but that was out of *Picture Post* or something like that.

*Did you have anything on the wall that identified you as a geographer or as having…*

No.

*And…*

The wonderful thing about the Oxford experience is that you do not necessarily associate more with the people reading the same subject than anybody else. You’re all thrown together and so you make friends based on whatever criteria you have for making friends, but that is not necessarily people reading the same subject.

*Given that mix then, could you say how geography or being a geographer was viewed by people taking other subjects?*

[0:08:17]

It was viewed as an easy option and still is. So people who don’t want to do hard science do geography and the other, nowadays, very popular subject that is not too demanding is media studies. Of course it didn’t exist in those days but nowadays when somebody says they have a degree in media studies you tend to be suspicious that it was an easy option.

*Did you, how did you yourself…*

[phone ringing]

[break in recording]

[0:09:08]
Could you remember any particular examples of the sorts of things other students would say to you about your subject of geography?

No, it was pretty much widely believed that it was an easy option because the requirements of school certificate or higher certificate were not in the hard science subjects and things have changed a lot now so that there are many more respectable geography graduates than in my day. But I would say that the majority took geography, read geography because they had not made up their mind about what direction they were going in life and it’s a good broad education and particularly if you’re interested in working abroad or travelling, it doesn’t do any harm to have a degree in geography. But also it’s like any other subject, training on research, in that under the Oxford system we had to write an essay every week and read the essay out loud to our tutor, and the tutorial system is marvellous for that, that you have an hour a week with somebody in overall charge of your studies and telling you whose lectures to go to and whose you can avoid if you want to. And this was very good because it established that you could write English and speak English and by reading it out loud you showed whether you’d understood what you’d written and your tutor could interrupt at any moment and say, ‘Could you enlarge on that?’

Yes, so they would soon discover if your arguments were a bit thin if you couldn’t.

They’d soon discover if you had copied them out of a textbook.

Your reasons then for taking geography, what were they?

[0:11:31]

The same. I didn’t know what I wanted to do and probably, probably had an inferiority complex in that I didn’t think I was bright enough for the hard science subjects, and this was the result of a careers master at Bryanston who interviewed everybody and said to me that he didn’t think it worthwhile me going to university because I couldn’t concentrate on one subject for three years. Under the honours degree system you are on one subject for three years and if I had believed him the course of my life would have been very different, and thank goodness I didn’t. So now when I meet schoolchildren of any age I say always reject
negative advice or discouraging advice, because they don’t know you and they’re probably reacting to a bad exam result or something. But to tell anybody, advise anybody not to go to university if he wants to, that I thought was wicked.

_The scientists, people doing subjects like physics or chemistry, what did they see as being more rigorous about their subjects than geography? Is there something in particular?_

I think they’re what’s… those are now called hard science subjects. They had probably all done higher school certificate and I had joined the navy at the age of seventeen just the summer before I would have done higher school certificate, so they were better educated in the subjects and people coming straight from school probably had a better idea than I did of the direction they were going in life. I was wanting a general qualification which gave me scope to do many things which I couldn’t put my finger on at the time. I did have this secret ambition to be an explorer and that I’d had ever since I was probably ten years old, stimulated by my mother saying don’t get stuck in an office like your father. And I read widely and I had classic Antarctic and Arctic books in my bookshelf in my room, which at the time you could buy up for ten pounds for a fat two-volume book by Scott or Shackleton and now worth 500.

_In your room at Oxford?_

[0:14:50]

Yes, I did. So I spent money both on polar books for my hobby, you could call it, and on textbooks and I think I spent more money on books than most people because many of the ex-service people went to a pub every evening and spent their limited money in the pub instead of books, so I did have a big collection of books in my room, that I remember.

_And the students doing the subjects that are now described as hard sciences, how did they view the content of geography, what you were doing compared to what they were doing?_

I really don’t think we discussed it. I think everybody in school knows what geography is as taught in school and they’ve all done it probably, or most of them, and so they didn’t ask.
They weren’t interested and I didn’t ask about the hard science because I didn’t have enough background to do so.

*Being quite a long time before C P Snow was writing about the two cultures, I wonder whether at Oxford at that time there was any feeling of difference among the arts and the sciences, whether the arts and science students had particular views of each other that you were aware of?*

[0:16:28]

The art students were largely ex-service and I’m wondering why, but I felt they had learned a lot about life and self-assurance having been in the service and they were more interested in careers in perhaps politics - philosophy, politics and economics – PPE was a very common subject for them to do, English, history. They wanted to broaden their mind and they probably had an idea from their service time of the sort of things they would like to do in life because they’d had years more to mature.

*And the scientists came from a different background and had a different view of their future?*

I think they probably did have a different view of their future. On the other hand the prevailing view at the time was that any degree opens doors for you and so a lot of them would say they have no idea what they’re going to do but they just want to have some qualification and of course, quite apart from the paper qualifications of a degree, possibly the most important thing of all is self-confidence, self-assurance that comes out of having studied and met a lot of different people.

*Could we now talk about the School of Geography itself? First of all, can you describe it as a physical place?*

[0:18:26]

It’s in Mansfield Road in Oxford. It was originally a private house and it was a large private house and had enough rooms for all the teaching staff and a lecture hall added on the back and a large room for the professor, who was Kenneth Mason who had been… he spent his
life in the Survey of India, topographic survey of India, which was a very big deal because it’s a very big country. And so he, when he was in training in the army, there was no such thing as a degree in geography at any university and so as geography was becoming popular then, they had to find somebody with broad interest and experience abroad.

And could you describe rooms in which you were taught geography, for example the lecture hall and tutorial rooms?

Tutorial rooms, you went to the room of your tutor once a week to read your essay and to be set the subject for the next essay and in setting the subject for the next essay some reading was suggested. Most often contradictory points of view with the view I presume to training you in being critical and in weighing up competing arguments, which is vitally important in any walk of life really. So I thought it was a very good education and the research I did for my weekly essay was probably the most valuable part of it. Of course I was going to lectures at the same time, but not all by any means. I was picking and choosing because some lecturers were better than others.

You said that your tutor would sometimes point out to you lectures that you might happily avoid – can you remember which ones he advised you not to go to and why?

[0:21:07]

I can’t remember that, no. I think it was sometimes that I would say so-and-so is boring, do I really need to go, and he will say, if you think they’re boring and you’re getting nothing out of it, well don’t go.

Was he on the staff at the School of Geography, your tutor, or just…

He was on the staff, yes.

Who was your tutor?

Paget – P-A-G-E-T. We never used first names in those days but I think it was Eric, Eric Paget. He’s long dead now, he died. He was a very nice man and his subject was France,
economic geography, every kind of geography of France and he was a great specialist and spoke French and eventually married a Swede, and eventually divorced a Swede, and then died. This is many years after I left. But he was a very nice man.

*Do you remember any lectures or lecturers who you did find boring and sort of asked whether you could skip?*

I don’t think I can. This is all a long time ago...

*Of course, of course, yes.*

… and I don’t think I can remember who was boring, but the main thing is, we didn’t need to go to more than half a dozen lectures a week, and this is so totally different from an American university where an undergraduate will be in lectures all day. So we were far more self-motivated than that. We had a pretty good idea because of the guidance of the tutor, what we should be reading.

*Do you remember any particular lecturers in the geography department?*

[0:23:23]

E W Gilbert had a great sense of humour and he lectured about historical geography and economic geography. He was a star, everybody went to him. But the other lecturers have gone out of my mind, obviously they didn’t make an impression.

*I think you may have mentioned a female lecturer in the school. Regional, a sort of regional geographer. I wonder whether Alice Garnett was there?*

No.

*No.*

I don’t remember.
Do you remember how regional geography was taught?

Yes. There were lectures about particular countries and the lecturer always suggested reading subjects. If you ever looked at a textbook you had a guilty conscience because you were supposed to be looking at original research papers and no lecturer ever recommended a textbook.

From what I know of geography at the time, two kinds of geography seem to be particularly popular. One was the kind of regional geography where you build up from geology and soils and vegetation and then look at land use and perhaps ethnography, and I was wondering how that was taught, but also land use surveying and the kind of applied geography. I wonder whether these methods were taught in a particular way or in a particularly self-conscious way?

Again, I can’t remember that, but when it came to 1948 and my Gambia experience, I was totally confident about what I wanted to do and how to do it. I can’t really explain why, I must have shown an interest in that sort of thing.

But I don’t think… I think yes, land use was an essential part of geography training. What causes settlements to be where they are and I’m trying to think of a book that I remember. *Influences of Geographic Environment* [by Ellen Churchill Semple], and really that is the nub of geography, if it can be expressed in a few words, and that was an American author. I think yes, land use was an essential part of geography training. I think I still have the book, thick book. And it addressed the relations between environment and settlement and people and ethnography. So that was a… I mean we all cheated at times and looked at textbooks, but in fact that was a research textbook and it was considered respectable to read.

*Did the academics in the School of Geography, were you, did you have any sense that they regarded geography, or had any sense of inferiority about their subject in relation to other departments in the university being a new subject, having this sort of unusual status?*

Good question, but I don’t know the answer.
I suppose you… it’s not something you’d easily pick up, you know, the confidence of the staff in their own… Was Frank Debenham on the staff when you were in the School?

No, he’s Cambridge.

Ah, okay.

I was Oxford.

So you met him through another connection. Okay, thank you. Do you remember or could you tell me anything about fieldwork which was School of Geography based rather than, I know you were in the Oxford Exploration Club, but could you tell me anything about fieldwork as taught in the School of Geography?

[0:27:52]

In the spring holiday I remember an excursion to Ireland with one of the faculty leading it and it was the Republic, it was south of the border, and it was really sightseeing with explanations and with challenges; why are people doing what they are and doing in this particular place, which is the soul of geography really, it’s a question you always ask yourself. And in fact the rest of your life with that training, if you’re flying over a country, I’m one of the rare ones nowadays who looks out the window, but I found myself asking that question, why are people here and what are they doing?

Can you remember any particular day – obviously it’s a long time ago – but can you remember any sort of particular days on that field trip; what you did, where you went, what in particular you looked at?

No, I remember the Blarney Stone. We all leant over the top of this tower to kiss the Blarney Stone, which is a very dangerous thing to do because it’s not very close to the top. But otherwise no, I don’t remember things.

Thank you. Could you tell me please about the Oxford Exploration Club, starting with how you found out about its existence at all?
I think probably entirely through looking at a list of clubs and societies you could join and that immediately took my interest and I went along and found the secretary, who was Geoffrey Hattersley-Smith in New College, and… [phone ringing]

[break in recording]

Oxford Exploration Club had a long history from the 1920s running expeditions both to tropical and polar regions, all undergraduates, normally, and the initiative came from the people who wanted to go, not from the club. The club had to have somebody representing the university who was a faculty member in order to establish that it was respectable and that was a necessary step in going to funding bodies, particularly Royal Geographical Society, to ask for a contribution. And you always had to wait until you had the university’s approval of your proposed expedition so that you could quote that in going to the Geographical Society and manufacturers of equipment and food were very, very generous in those days. I think it was before many of the smaller universities established their own exploration clubs and Cadbury’s chocolate has become rather fed up with expeditions asking for free chocolate, but at that time they had not been overloaded because we’re not long after the war, and we were given many, many things. And I was a fundraiser and I think collector of those supplies that we needed on both the Iceland and the Gambia expedition, we did well.

Why tropical and polar regions?

Simply what was being planned at the time and whose initiative it was. There probably were only two expeditions a year that were approved by the university and so there was Iceland and the tropical one I can’t remember. But the following year it was simply, going to the Gambia, was simply the Colonial Office had written to somebody saying we are interested in encouraging people to join the Colonial Service and when whoever was dealing with that correspondence said yes, they gave us £600 which was very generous at the time. Not £600 each, 600 for the whole expedition, but that was real money in those days and so we
contributed ourselves; the tradition was that every expedition member had to contribute a substantial sum of money. In those days it would have been fifty or a hundred pounds, and that’s how we made up the thing and that’s how university expeditions distinguished themselves from pure jollies, pure fun, that people were putting money into it. And then we went to other funding bodies, I can’t remember who. Well there are Oxford internal funding bodies that give you a bit and then as many free things as we could get from manufacturers.

*Apart from drawing funds and contributions from these various official places, how else do you think you distinguished what you were doing with the club from jollies, as you put it, how else did you mark yourself out as being different?*

[0:34:25]

Well the only thing I can remember as jollies while an undergraduate was ski-ing in Switzerland and that was organised by the Oxford Ski Club and the interesting thing about that was that in those days we were only allowed to take seventy-five pounds out of the country and that was enough only for living very humbly abroad. But when we got to Switzerland we discovered that you could sell your travellers’ cheques and buy back pound notes for less than you had received for your travellers’ cheques, so we all took the maximum amount of travellers’ cheques and when we’d finished spending in Switzerland we bought pound notes, and I remember getting seventy-five pounds, and I came back into the country with seventy-five pound notes, legally as far as Switzerland’s concerned and I’ve often asked myself who suffered and I think the answer is that much devaluation of the currency because we had brought in more British currency. But everybody did that at the time.

[0:35:58]

But the university expeditions, yes it was… I jumped at whatever was going, but since I’d had this interest in exploration I certainly jumped at the Iceland one and that was organised by a botanist called Fred Whitehead and we had six of us altogether and reading different subjects. I… we may have had one other geographer on that but we had people doing… I can’t remember what exactly, but we were reading different things and the thing is that these expeditions in the Exploration Club are organised inter-departmentally. I mean the undergraduates are organising it themselves but they have to get approval for using the name of Oxford. And the six of us… and we had a very exciting time. Yes, I’ve given you lots of literature but not actually my diary from that expedition, but on the main ice cap in Iceland,
Vatnajökull, it was a very wet summer, it was raining all the time and we were plunged into
being out in the open air in cold weather and wet weather for the first time in our lives I
think, and it was a wonderful training. I realised later, for the Antarctic in that I was never as
miserable in the Antarctic as I was in Iceland by being both cold and wet. Never get wet in
the Antarctic because it would be dangerous. But here we were rained on. We had organised
polar equipment, windproof tents. Well, a windproof tent, the rain can go straight through,
so that was a hard lesson learnt, a very good lesson. And sewn-in groundsheet we had and
the hard lesson about that was with the water coming through the canvas it puddled on the
groundsheet and we did have waterproof covering on the sleeping bags, they were ex-army
sleeping bags, but we found our feet floating in the puddle and some of this getting into the
sleeping bags. So we were absolutely miserable and I’ve always thought that was the most
wonderful thing because I’ve never suffered so much since, and it was a good test in keeping
our morale up and keeping, trying to keep cheerful. One member of the party didn’t, showed
signs of what in those days we called exposure, nowadays you call hypothermia –
hypothermia was not used, a term not used at the time – but he was suffering from exposure
and he had sub-normal temperature, couple of degrees as I remember. His name was Alan
yes. And he, the symptoms he was showing was that he wouldn’t talk and wouldn’t answer
questions because he was that miserable, and we suspected that he was getting pneumonia
through being cold and miserable and so we should get him down as soon as possible. And
of course nowadays everybody would have a radio and you’d call for a helicopter or
something, but in those days you got yourself out and so Whitehead and I, being fit,
accompanied Alan Treloar, who was well capable of walking, off the ice cap, and we wanted
to get him down to the coast, which was quite a way, as soon as we could and get him into a
place where he could warm up because we couldn’t warm him in the tent as everything was
so wet. And it turned out to be the longest walk I’ve ever done; forty-five miles, and the
patient also walked the forty-five miles, but when we got down to the coast road, hoping to
hitchhike, we were I think travelling two telegraph poles and then stopping for a rest, two
telegraph poles and then stopping for a rest, we were absolutely whacked. But a car did
come along and it did collect us and when we got to the place where we were staying we
called a doctor and he came along and gave Alan Treloar some pills and in the warmth he
recovered. That was a good lesson I think in exposure, which is a very dangerous thing, now
called hypothermia.
[0:41:55]
But in terms of doing any experiments on the ice, there was a lot of water around and streams to cross and hazards like that. We had ropes and there was one place where we got into such a maze of crevasses that we roped up. Another memorable moment was we were manhauling these sledges and we had just crossed a snow bridge and the weight of the sledge broke the snow bridge and because everything was soaked, the snow was soaked, we started, the sledge started sinking into the snow bridge and thought it might break at any minute, and so we were on the far side with the sledge which was quite heavy enough to pull us into a crevasse and kill us, three of us I think it was at the time, and we were duly scared stiff. We took off our skis in order to dig our boots in to get purchase to pull the sledge across, but that was a very scary moment.

*Do you remember any scientific work that you did on that...*

[0:43:19]

I did. And it was really through observing what are now called dirt cones, which are very interesting in that you have piles of rock material on the surface and ridges usually, and you wonder how the material got there. Well, Vatnajökull in Iceland has frequently been covered by volcanic ash from eruptions of volcanoes which are quite, one or the other, quite common, and so there are layers and we were in the ablation area and as the surface was melting down quite fast it would expose these volcanic ash layers on the surface and they would, if they’re thick enough they would protect the ice underneath, whereas on either side if they’re thinner, you would have the streams all melt. So you’ve got ridges up to eight feet high covered by sufficient – and I’m talking about a couple of inches – to insulate the ice instead of accelerating the melting where the dirt is thin it accelerates the melting. Where it’s thick it protects it. And when I came home I discovered that very little had been written about these. There had been one paper by Vaughan Lewis, Cambridge geographer, but we had seen rather more and I forget, but anyway, I was encouraged to write the paper by the founder of the British Glaciological Society, Gerald Seligman, and did so. So a paper was accepted in a very respectable journal, still is, *The Journal of Glaciology*, which is now the organ of the International Glaciological Society spread from British Glaciological Society, it’s now worldwide. But I’ve got a paper in volume one of that journal which now has about two metres of shelf space I think, of the journals. And at the same time was encouraged by somebody in the Meteorological Office who had lent us instruments - this is a normal thing,
you always cadged whatever you could – lent us a thermometer and anemometer to write
about this and so I had a paper in *The Meteorological Magazine*. So these helped a lot when
I wanted to go on the Norwegian-British-Swedish expedition because no other people
coming straight out of their undergraduate years had written two papers for publication. And
so this was an advantage.

*You say that you were encouraged by, you’ve mentioned two fairly senior scientists, how did
dey come to be encouraging you? How did you…*

[0:47:04]

Because I described the weather we’d encountered and we did have a rain gauge down at the
coast so there were reasonable figures and then the official weather stations confirmed what I
wrote that it was an unusually wet summer and so it was in returning the instruments to the
Meteorological Office that they said why don’t you write an article for the magazine. It was
either *Weather* or *Meteorological Magazine*, there were two meteorological magazines at the
time and those are the names: *Meteorological Magazine* was one and *Weather* was a more
popular sort of thing. I’ve got reprints of the paper.

*And how did you come to be encouraged by the man who said you ought to write about the
ridge features? How did you know him?*

There were not many people in those days interested in glaciology, but that’s why the British
in some respects led the world, because this man Seligman set up and started a newsletter,
something to do with snow and ice, which later became *The Journal of Glaciology*. And so
if you had seen things which interested other people – and nobody was called a glaciologist
at the time, we were all described by the subject we did in university – and one of the
inspirations in British glaciology at the time was Max Perutz who later went on to get the
Nobel Prize for solving the molecular structure of haemoglobin, and he had been a great skier
before the war and an amateur glaciologist and in the 1930s there was much discussion
internationally about how glaciers flow, whether the surface flows faster than the ice beneath
or whether the ice beneath being more, being softer, flowed faster than the surface, and
crevasses look as if they’re formed by stretching with the ice underneath flowing so that the
surface can’t accommodate the flow as deeper ice can and so you get fractures, which are
crevasses. And so I was introduced to this founder and President and Editor of the Society for the Study of Snow and Ice, it may have been at the time, by Geoffrey Hattersley-Smith who happened to live near Gerald Seligman in Kent and it was he who encouraged me to write about the dirt cones. And so then I was going to all the lectures of that group wherever they were, Oxford or Cambridge they were at the time, and meeting other people who were interested in ice. And so I certainly got a great deal of value, both practical and professional out of the Iceland expedition and that certainly counted later because when after two undergraduate expeditions I applied for the Norwegian-British-Swedish expedition I was probably the most unqualified person you could imagine. I was certainly the youngest, I was twenty-two years old in 1949, and the fact that I’d been on two undergraduate expeditions and produced results from them was obviously a good thing and also meant that the powers that be, Royal Geographical Society and Scott Polar, could make discreet enquiries about whether I was hell to live with, which is very important for two years in the Antarctic. And in those days it was a real question, could you carry a heavy rucksack. Nowadays we don’t even ask people that because not many people have to. But it was a good sort of confirmation of interview that I was probably going to be alright in spite of being the least qualified and the youngest.

How precisely did you study the ridges? By drawing them, by mapping them, by measuring them, by photographing them? How?

[0:52:53]

Measured them and photographed them and found that they all had a crack in the top which was filled with dirt and so our explanation, which other people have confirmed since, was that they were formed from this volcanic ash flowing into crevasses and filling a certain depth in crevasses that protected the ice. Now in the ablation area in Iceland the rate of ablation in summers is absolutely colossal, many meters, and so the general surface had melted down until it was getting to the bottom of these crevasses where there was this accumulation of dirt, and so the relief was being reversed in that what was in the bottom of crevasses was protected and appeared to rise up – it didn’t of course, the rest of the surface melted down.

And how precisely did you measure them?
Measuring the thickness of material with a ruler, that’s all.

Thank you. Was this an all male party of six?

It was all male, yes.

And you mentioned that it was initiated by a botanist.

Botanist, Fred Whitehead, yes.

What was his interest in Iceland as a botanist?

I think you see in all undergraduate expeditions there’s a mix of interest in where you’re going and in your subject, how it might apply to the country you’re going to. And he was interested in marginal conditions, what things you had going on in the botanical world in situations very close to an ice cap and he had quite complicated apparatus, as I remember, for looking at the chemistry of plants, but I don’t remember exactly what he did. And I’m sure he published on it later, but I by that time had gone to a different world, the Antarctic world, and I never followed up what he did publish.

You mentioned the, what you think might have been called the Society for the Study of Snow and Ice, through which you met various people in Britain who were working and you said that there were no professional glaciologists, but these people were doing different sorts of subjects; geography and others. What other subjects made up people who were studying snow and ice at that time?

Gerald Seligman was a chemist by training. Max Perutz was a physicist.

And did you meet him in this society?
Yes. And for Max Perutz it was his primary interest in the 1930s, but getting a job in Cambridge he got into molecular biology and was obviously a major pioneer in that, but that all came much later. What he’d done in Switzerland which made him famous among glaciologists, was to solve this problem about whether the surface was moving faster than underneath or vice versa, he said, well very simple, we drill a hole to the bottom of a glacier and put in a pipe and measure the inclination, put an inclinometer down, measure the inclination all the way down. Well, it was nominally vertical, but it was measured. Seal the top of the pipe, come back in a year’s time and lower the inclinometer again. And that produced a classic curve showing that the top part moved pretty much uniformly but as you got near the bottom the rate of movement tailed off because of the friction on the bed. Well, one of my later sayings with a bit of a giggle among glaciologists, I said well, all knowledge is obvious when you’ve found it out. That’s Swithinbank’s first law. But here was a high-powered physicist and others wanting to look at this problem directly and work out a flow law for ice. Now ice didn’t have any flow law until after the war. I think Max Perutz probably did promulgate something but after the war two physicists in Britain, both of whom are alive, one is John Glen, University of Birmingham, and the other, I’m struggling to remember the name, is in Bristol and he got his FRS and they worked out a flow law for ice which has been a major subject in glaciology ever since because does it vary from place to place or under what conditions does it vary. And at the time, trying to explain to a geographer, said well, materials which can flow either flow plastically or as a viscous fluid and so flow laws for plastics and viscous fluids are known, but for ice was not really known. That is to say, it was not known sufficiently to satisfy critical physicists that they had the right answer and that’s why these two – John Nye is the one in Bristol, Professor John Nye, he got his FRS in the end – were sort of encouraged probably by Seligman to look at this. In those days we were, glaciologists were acutely conscious of the lack of physicists looking at ice and that’s why those two people were directed to ice as being an interesting subject to study and ever since in my career, I ended up with a group in British Antarctic Survey of, well, a scientific staff of fifty, about a third of them glaciologists. I only employed one geographer the whole time because I knew the limitations of geographers, knew very well, and that was to do specifically mapping projects. But all the other people I recruited were physics, chemistry, engineering, geology. And that’s the way we wanted. It was obvious that glaciology should go and that’s the way it has gone. And mathematicians now added.
So a respectable group of glaciologists now might have a geographer, but mostly mathematics, physics, chemistry, engineering.

*Did you meet John Glen and John Nye as far back as this in the Society for the Study of Snow and Ice or were they as…*

[1:01:42]

Probably shortly after coming back from the Antarctic at a meeting of this Snow and Ice group.

*And can you remember about them? At one point just a moment ago you said that they at one point were explaining sort of the physics of this to a geographer, to yourself, can you remember how you felt when you were encountering this kind of science or when they were telling, you know…*

I don’t think I did say they were explaining it to a geographer.

*Oh, okay.*

I looked up to them as a geographer interested in physical sciences tends to look up to a physicist and I don’t think they could explain except in mathematical terms that I couldn’t understand. But I respected them and I played a big part over the half century in moving glaciology in the direction we thought and discovered that it needed in getting other specialists.

*Yes. Thank you. Could you now tell me what you can remember about the Gambia trip? So whose idea it was to start that, who the group was composed of?*

[1:03:13]

The idea was – usually these things come from several angles – Francis Huxley, who was the son of, I think of Julian Huxley, and he was a zoologist and he was in, I forget whether he was in Oxford or Cambridge. You see this ended up as an expedition with six Oxford and
three Cambridge people because we didn’t have enough funds or projects and we wanted to be able to turn our minds to everything, but the origin, which is almost laughable but was real, was the government of the Gambia wanting an explanation of why the hippopotami rolled on the rice fields and a hippopotamus rolling on a rice field in one night can destroy enough rice to feed a family for a year. They climb out of the river and rolled. And ate rice, I mean the whole plant. I think they knew the answer, which was either to build fences along a very long river, strong enough to resist hippopotami, or to shoot them. And that was obvious from the start but the government felt that in order to bring either of these solutions into legislation they needed a respectably argued report and therefore you needed a biologist to look at the hippopotami and you needed an agricultural scientist to look at the effect on the crops which were on the flood plain all along the river, it’s what the whole population of Gambia lived on. And so one man named Roger du Boulay from Oxford was doing agriculture in Oxford and he went into the Colonial Service later, several of us did. But the Colonial Office offered £600 which was a very welcome contribution to the finances of the expedition and it was a gamble for them on whether it would produce people who wanted to go into the Colonial Service, but they got far more than they bargained for in that one way or another six out of the nine of us had some connection with the Colonial Service afterwards and so it was a very good bet.

And we had just the botanist and the zoologist, Francis Huxley, do the hippopotami because it clearly wasn’t a subject that other people could do and therefore the rest of us found subjects more of interest with what we were reading and being a geographer, the relation between environment and people and therefore crops is basic and we probably talked with geographers who said well, the only way to look at the practices is to do Land Utilisation Survey, as it was known then, Land Use Survey now, and that meant surveying. Now from my Oxford degree I had training in surveying so that was not a problem. It was a very big practical problem because so much swamps and working through swampy forests and swampy rice fields, but the principles are very simple. And having established a map, we needed to plot on what the soils were and then also plot another map of what the crops were, because all these things are related. And so I did the survey, I was in charge of the survey. I needed the other people to help me with it and so there was a team of us doing the survey and the government of the Gambia, being interested in our survey, gave us free of charge a survey assistant. I forget his name but he eventually became Head Surveyor of the government of Gambia. But he was fighting his way through swamps with us in waders and
doing the compass traverse as a basic framework on which to hang local services, local surveys and hang an air photo because Gambia was one of the first countries after the war that was photographed from the air vertically by the Royal Air Force. And so they had one astro-fix I think in the whole of upriver Gambia and that was where we were, at this Kuntaur, so that we had that one fixed point to hang it on, not that astro-fixes were very precise, and the aerial photo. So that was a very good basis, but the scale of the photo was not known, that’s why we needed a compass traverse to hang it all on, but it was an extremely useful basis for the map. And having finished the mapping, I got interested in the history of the country and all related to the things you’ve read in the essay I wrote about upriver Gambia and so studied the history, the government and the way the British I think throughout their territories showed great skill in collaborating with the traditional chiefs’ hierarchy rather than abolishing it. Because if you abolish it you’ve got to put something in place and you need a lot of people to do that. And in the Gambia, that district of the Gambia, MacCarthy Island Province, there was only one man and his wife who were governing hundreds of thousands of people, successfully, peacefully. There was one hospital in the district and if you were a patient you had to either walk there or get some transport, which was extremely difficult. There were dirt roads. And the hospital was run by British staff, I suppose probably paid for by the Colonial Office. And so the District Commissioner could only function if he commanded the respect of the traditional chiefs, which were at two different levels, one called a Seyfu and the other I forget [Alkali]. And so any disciplinary offences short of murder were dealt with by the Commissioner and by the local chiefs. And the only crime for which you needed a trained judge was murder and when there were murders, which were very rare, the resident judge in Bathurst, the capital, came upriver and put people on trial there, but that was very rare. So the District Commissioner solved all the local problems and this, I think all of us were consumed with admiration for the fact that one man who could easily have been shot or murdered by the locals was looking after them as best he could on the budget he had.

[1:13:34]
The great export was groundnuts and ocean going ships could come right up to Kuntaur, it was the limit of navigation for ocean going ships, small ocean going ships. And so there were big… there were big warehouses for putting the groundnuts in. And otherwise, as I say, I did a lot of reading, borrowed books from the District Commissioner and then when I came back before writing my final essay, did a lot of reading on, books and government reports about the Gambia.
Could I ask you to explain in more detail how you made the Land Use Map, which is reproduced as Map 4 I think in the back, and if you could explain it for an audience who won’t know any of the technical terms at all. So the terms like astro-fix and that sort of thing, I mean what is that and how exactly did you move through the swamps, what did you do, for people who listening to the tape may…

[1:15:01]

The basics of a simple survey are that you start from a fixed point. Now the fixed point should be, have its geographical co-ordinates – latitude and longitude – known as precisely as possible. And then you do compass traverses. Well a compass traverse means that you are doing a series of legs the length of the chain or tape measure that you have between two instruments, one being a compass and one being a target and a chain is not very long so you can certainly shout to each other, and four inch or six inch compass that we borrowed from the Royal Geographical Society – they’re very good at lending instruments, they were – and the chain and you do a leg. So you’ve got the direction, compass direction, and a measurement. Then you do another leg, compass direction and a measurement, and another and another and another, but you always aim to come back to where you started. You then plot these on a piece of paper and you discover that you didn’t get back to where you did get back to and so there’s a cumulative error in the survey, which is inevitable, and you distribute that error graphically by putting vectors, arrows in the direction of the misclosure, the difference between where you thought you landed up and where you did land up, and distributed these by taking increasing amounts along the traverse so you were moving the whole thing, assuming that the error was cumulative throughout the traverse, even if it was many miles. And if you didn’t have any other information that’s all you could assume, that it’s been accumulating. And so you spread the error evenly. Well that’s your survey framework and you may do one, you may do more, but always based on the best charted point that you started with. Ours was an astro-fix which meant that the colonial survey – what was it called – the Directorate of Colonial Surveys, it was called at the time, had sent a survey party, set up a theodolite, accurate theodolite, probably – yes – and surveyed stars, the angles to stars with time got over the radio from Greenwich time signal or the, there’s American one which is even more powerful. So you’ve got to have time and angles to the stars. And this is all written about in textbooks, particularly that volume one of the *Hints to*
Travellers I mentioned and… but we were just given the co-ordinates; latitude and longitude to a fraction of a second of arc and a second of arc was perhaps a hundred feet. So not nearly as accuracy as you would have nowadays with a global positioning system, but it was all we had.

[1:19:15]

And so that was the starting point of all our surveys. And remember that we had this aerial photograph, so we were able to scale the aerial photograph from this survey. And that’s how we landed up with our map and then the soil scientist, Roger du Boulay went round taking soil samples, which he took back to Oxford and came up with… well he knew most of it by looking at it but I think he took samples back for doing some chemistry. And the other people recorded crops and patches of forest we got direct from the air photographs, that was easy, and the trend of the river going through the district was easy. And the villages, again, they were on the aerial photograph but we visited all the villages within the 150 square miles that we were surveying because some time had elapsed since the Royal Air Force had done the vertical photograph and so there were a few changes and a few new buildings and so we updated it. But that’s how it was done.

How did you travel around such a… the area to all of the...

[1:20:59]

Very largely walking, we didn’t have any mechanical transport. So we were walking very considerable distances and carrying our survey equipment on our backs. Wherever we could find a track we walked along a track and there were tracks between all the villages. I had my bicycle, which I still have hanging in the garage outside here, and had taken that in the ship to the Gambia and I did quite a lot of cycling by myself as part of my own research on these footpaths, and even crossing the river in dug-out canoes. I’ve got a photograph of my bicycle in a dug-out canoe being taken across the river. People were extremely friendly, they knew some English. Not all of them by any means, but some of them knew some English so they were all very keen to help. Occasionally you’d go to a remote village where quite probably the locals had never seen a white man and so parents looked nervous and children ran away screaming until we had established that we were friendly.

How do you think they viewed you, what did they think you were doing?
I don’t think any of them were suspicious. They may have been but they didn’t communicate that because if a government is going to charge land taxes it’s going to be related to how big your property is and so in other countries I know that the survey authorities had been attacked because the locals can see this is going to result in taxes, but our Land Use Map might have been used for that purpose afterwards, I just don’t know. But they were curious, is the answer, about what we were doing and why and that was fairly difficult to explain with limited English.

*Because presumably, well almost certainly, this is an area where there was no tourist travel at all…*

No.

*…so they wouldn’t have explained you in that way, so I wonder…*

Long before tourists and even in Bathurst, the capital, there were no tourists in those days.

*I was just wondering what they thought of men – all men on this trip again?*

All men, yes.

*Walking back with bits of equipment and, you know, getting views of places and…*

Yes, well they probably just thought white men do strange things which are unexplained and we’ve got to lump it because they’re peaceful. No, I don’t think, I don’t think it bothered them particularly. It may have bothered one or two because of putting two and two together and thinking it might be related to taxes.

*Could you say something about your view of them as people?*
[1:24:34]

Yes, but first I’m going to…

[break in recording]

[1:24:40]

Yes, so if you could just tell me how you viewed the people there?

On this Gambia trip?

Yes.

Well, they were all, apart from the three geographers I think, there were people: botanists, zoologist, agricultural scientist, entomologist, had their specialty and we naturally called them in whenever something came up which was relevant and the entomologist was collecting everything he could, every insect, and the people who were obviously going to write the hippopotamus report said well they couldn’t check until they saw inside a hippopotamus’ stomach. And so we got special commission from the District Commissioner to shoot one hippopotamus and this was against the law for the locals. And obviously extremely popular when it happened because it was dragged up on shore and everybody came along to get a bit of the meat and in that climate you have to act pretty quickly. And our, I think it was mostly Francis Huxley with the help of others, cut open the stomach, enormous flood of rice greenery came out so there was no doubt that that’s what their main diet was. And then when we’d finished, which only took an hour probably – we had to have the locals help us pull it out of the water because it weighed a ton or two – and so they were all standing around waiting for us to finish our investigations and we measured it end to end and all its limbs, and then we said okay and let them loose and they all charged in with knives and worked up pieces, but they were pretty fair, I think they were taking a family hunk, and carried it away. So they were very grateful for just having that much fresh meat free of charge.
And could you tell me what you remember of your views of the native people in the country on the trip?

[1:27:47]

Friendly is mostly what I remember, all of them friendly. There were some shops in Kuntaur selling some foods and clothes on the high street, but everybody was friendly. Of course we proffered friendship because we were wanting to get information out of them for whatever we were doing and the best way to start is to be friendly. And so they were unfailingly helpful as I remember. I made a film, a sixteen millimetre film, black and white, which was shown afterwards at the Royal Geographical Society, I think probably Francis Huxley gave a lecture because in those days these expeditions were not that many and therefore the Royal Geographical Society had evening meetings and someone who’s good at giving a lecture about subjects that fellows are interested in, and I made this sixteen millimetre film but I had trained myself, no, been trained for it by a two-day course at the Colonial Film Unit in London, this probably came up through Colonial Office connections. And I’d had a two-day course specially for me and do remember the fundamental lessons, which is always use a tripod because there’s nothing worse than handheld – it’s called hosepiping, people jerking round – so if you’re going to do a pan, do it very slowly otherwise it gets fuzzy. Use a tripod so that the picture is clear. You’re allowed to follow movement by panning the camera, a person you’re following, but otherwise you want to do a mixture of long shots and close-ups. And this turned out to be, to interest a lot of people. When we’d used it for lectures… I had it copied, which was the respectable thing to do. I edited it by hanging these lengths of sixteen millimetre film on the wall from paperclips, which is all very professional way of doing it, and cutting them to the sort of length of shot that you thought they deserved, and then splicing it all together into one long film. Well, in that you have a lot of splices which are weak points, and also you don’t want to go projecting that because it will fade with a powerful projector light going through it, so that if you can afford it, once you’d finished the editing you sent it away to Kodak’s to make a copy of and then you didn’t have any splicing problems. And I did that and I think we gave either the original or the copy to the Royal Geographical Society afterwards; they had a film library. And eventually, with all this propaganda about film being dangerous from fire point of view, they gave it to the British Film Library, British Film Institute and they had looked after it for me as best they could and always asked if they were going to show it. But then with me being diverted to Antarctic
interests, they, when they came to give their whole film library, which was of course very substantial, films from all over the world and Everest expeditions and things like that, they didn’t consult the people because I had not placed conditions on its use, the Royal Geographical Society was somebody you trusted. And they gave it away to the Film Institute and then many years later I thought it would be nice to have a copy for my family and asked for a videotape – this was before CDs, DVDs – and they said yes, according to our standard price list, you can have one for £200. And this was my film that we had paid for and I had shot and they wanted £200! But the worst thing of all is that they had lost half of it and I was absolutely appalled that these people who were supposed to be respectable custodians of historic films would lose half, so I only got half and I paid £200 for it.

That’s dreadful.

[1:34:17]

But that was just a sideline. Of course the survey came first, that was top priority, and doing our job. But when I’d finished data gathering and had time to spare to do the filming and the book research, then I could do that and having some training, it was considered a very respectable amateur film at the time because so many people handhold… And I later went on to make a film of whaling in the Antarctic because I was hitchhiking to the Antarctic in a whaling factory ship and I filmed and again I used all of my lessons; use a tripod, follow motion, get a mixture of long shots and close-ups, and that film is only fifteen minutes but it’s been widely used because it’s very difficult to find modern films of whaling because the whalers became, as soon as Greenpeace evolved, the whalers became very nervous of anybody photographing what they do. But at the time, 1949, they weren’t nervous at all, nobody did anything to stop me. And this film of course I gave to the Royal Geographical Society, I gave a copy to Scott Polar, and I have given copies to many lecturers on cruise ships because there’s nobody alive these days except me who can talk to cruise passengers about the bloody business of whaling, the fact that we had 2,000 tons of whale over the deck in twenty-four hours, sometimes we were very successful as whalers go. And so I’ve got that film on CD now, which I actually give away to people – I’ve done lots of cruises since retiring, as lecturer, and I show it and of course the lecturers say, well that’s wonderful, could I have a copy. Well I send them a copy. Silent, but later the man who founded the Natural History Film Unit. I’m struggling to remember his name [Tony Soper] – in Bristol it was,
was on a cruise with me as sort of cruise leader and I showed this and he said well why don’t you put a soundtrack on it, why don’t you dub it, and I said I didn’t know how. So he came along and we played it on my television with me recording into the microphone and he took that to the BBC in Bristol and said we want you to dub this on to a copy, which they did. But I was appalled that the tape recording was not synchronous with the video and it was quite obvious how to edit it so that it was, because I was simply describing what you could see in the photo. And so I’ve used it, but it’s probably ten to twenty seconds wrong in places, which is absolutely stupid, but I haven’t the technical means to do another one so… people use it all the same.

Your training for the filming, apart from the technical and cinematic aspects of mixing the sort of shot, keeping it level, did they give any advice on what to film or what not to film in the sort of environment you were going to?

[1:38:46]

No they didn’t really, that was entirely obvious to me what would interest, what I thought would interest people. But I remember at the end of my two-day course I was given homework and that was to take the camera back home and make a script, film, in other words a close-up and long shot, medium shot, panning or whatever, and then have somebody act the script. And I chose my cousin who was a friendly soul - ended up as Sir Kelvin Spencer working for the Ministry of Fuel and Power – and he was living in a flat in London and I said, may I make a film of you - I want to make a film of you ironing a shirt. And so started with a long shot of setting up the ironing board and plugging in the iron and then coming close up to see the action and then his face. That was my homework which took a few hours and then I duly spliced that together afterwards and I don’t remember if they did critique you or not, but they probably did. But that was the basis of my training and filming, a couple of days’ work.

What was your view – obviously I’ve read your thesis and the conclusions – but I wonder whether you could say for the recording your view of the people and the problems of the region and your view of the possible solutions?

[1:40:48]
You mean apart from the hippopotami problem…

Yes.

… which we wrote a report about. I think reliance on one crop was something you would advise against nowadays. It had been traditional and they were planting groundnuts wherever they could grow groundnuts and had a family plot and so I would think now, looking back on it, that reliance on one crop which was, fetched a good price in those days. You remember in 1948 they had the Groundnut Scheme, which was a failure in some countries and successful in others, to boost the amount of groundnuts which was used for margarine in this country, part of our margarine ration. And remember that there was still food rationing up until after 1952 when I came back from two years in the Antarctic, it was still… almost every other country in Europe had stopped food rationing by then so it was clearly what was causing the rationing was our shortage of foreign currency as a nation, having sold the Argentine railways and other investments overseas, and that’s why we were still rationing. But the other problem was what were called ‘strange farmers’, that is to say, farmers coming over from French territory, which … outside the Gambia. The Gambia is a narrow strip of land on either side of the river and beyond that is Senegal and of course there were no effective border controls at the time and so farmers would come in and – from Senegal – and start farming land in the Gambia because the border didn’t mean anything to them and if they could find an unused bit of land they would use it. And eventually the locals became a bit upset about this and so there were questions of how to stop the ‘strange farmers’ coming to the Gambia. And then of course, totally open border. I don’t know if it was legally open, but there were so many roads you couldn’t stop traffic across, so anything which was in short supply was readily available by smuggling from Senegal.

*I don’t know how recently you’ve read it, but I wonder looking back what you think of the sort of status of the sort of European outsiders coming in and making recommendations about pushing the region on to a higher level of civilisation and common to lots of accounts of places abroad at the time coming from Europe, comments about the climate producing a kind of stagnating effect on the people, of people - these aren’t terms that would be used now but were very common then – of people being slightly backward and lacking in rational decision making skills and that sort of thing. Presumably this was a kind of discourse on the*
place that was just common at the time and the geographer going into a place like this at the time would be expected to write these kinds of observations.

[1:45:10]

Our education at the time was so, so far above the locals who probably most of them didn’t go to school at all and a lot of them couldn’t read or write that they tended to look up to us and when things were communicated, which they probably couldn’t read but were told about, they tended to accept whatever recommendation we’d made, provided it didn’t upset the status quo. And so as far as I remember, there were no difficulties in wanting to cross-examine the people as we did, we always got very full answers and we discovered the local jealousies and competition between different interests. But I don’t remember anything notable in that way.

Did you feel a sense of superiority at the time?

We knew we were, which is the honest answer. But not as humans, just because our education. As humans there was every reason to respect the people, that they had mastered the landscape, the inter-tribal rivalry and we had, I remember having very great respect for the locals.

Do you think that your having experienced your father and mother’s very benign attitude to the people in Burma, did that influence the way, or how did that influence the way that you conducted yourself on that sort of trip, if at all?

[1:47:40]

It probably did because my father had a very real respect for the Burmese in his decades there and had communicated that to me and certainly if we had ever spoken down to natives as a child we would have been severely reprimanded. But these were human beings and you’ve got to treat them properly although numbers of them were our servants, but we respected our servants. And so I probably did have that background and showed respect to the locals and they responded.
And what particular advantages did you feel that your education had given you that the people lacked? Was it an understanding of science, was it ability to make decisions? What in particular had education given you that you sensed they lacked?

One of the principal products of education is the ability to discuss subjects for which you have no training except training of the mind, to use the mind, and the locals living in a very small world without knowledge of the world outside would find it difficult to take an interest in our lives and took an interest; we took an interest in them. I think they just assumed that white men coming in would come in for a purpose and our purpose was benign and therefore there was no reason for them to be unfriendly or resistant.

Thank you. Could I now ask you what you can remember of first taking an interest in and applying for the Norwegian-British-Swedish exhibition – expedition – so you write that it was quite widely advertised. Could you say a little more about where and how and why you went for it?

[1:50:25]

The senior member, as he was called, of the Exploration Club, or one of the senior members – there were several, I remember another being Sir Alister Hardy – and this was Scott Russell who was a lecturer or reader in the Department of Agriculture and was by training a botanist. And he and his wife, who I’m still in contact with, felt it was their job to grease the social wheels and therefore they had coffee mornings for the members of the Exploration Club and the critical one was in Bateman Street, they had a flat in Bateman Street, and I suppose there were a number of us there, perhaps forty, being served coffee by his wife and he had been asked probably by Launcelot Fleming who was at the time the Director of the Scott Polar Research Institute, or by the Royal Geographical Society – Larry Kirwan, the Director, later became Sir Laurence Kirwan – to find British people who wanted to take part. Now, Scott Russell had this assignment and was asking round the people drinking coffee whether they’d like to go to the Antarctic and of course people asked well, for how long, and he said two and a half years, and if there were others they said oh that’s too long, it’s taking too much of a chunk out of my life. It was considered ‘out of their life’ whereas of course for me it was ‘in my life’. And he got round to me and said, ‘Would you like to go to the Antarctic?’ in a very dull voice, expecting the same answer, ‘Not bloody likely’ or something. And I jumped at it
and I said, ‘Yes, I would’. And he said, ‘It’s two and a half years’ and I said, ‘Well, the classic expeditions all were two and a half, so that’s what I’d expect’.

[1:52:53]
And then the wheels started turning because there was a national committee in each of the three countries involved. This was the first international expedition in that the three countries had committees in each country and they all had to agree on what you were going to do. And the committees consisting of people who had status and position in the world were far more difficult than living with, we found, living with the people because they were representing their country and their country’s learned societies. And so afterwards it was well known that we had had the easy part and we had lots of laughs about it, that people who went to the Antarctic had the easy part compared with these competing committees who were competing about who spent money on what and they were people who thought that they had unique knowledge of what equipment we should have. And so there was… there were things there which had to be ironed out, but the British contribution, as I remember it was quarter of a million pounds and the Norwegian was about twice that. Because the Norwegian interest was because it was in their claimed sector of the Antarctic that we were going and they had had a great scare in the 1938/39 summer in that an expedition was despatched by the Germans, Hitler, to go down there to claim territory. And they went down there and the Norwegians learned through some spy system, I mean it was very difficult to keep quiet when you’re going to the Antarctic, about it and got a formal claim to the territory a week before the Germans got there, and in those days a formal claim meant something, and nowadays people would say well the only way you can claim sovereignty over an area is by effective occupation. Well, nobody occupied it then and not since. And so they had that aspect that made it more important for them, but they couldn’t afford the whole thing by themselves because we’re talking about chartering a ship to take us the whole way south and then coming back again to take us out. And obviously for exploring an area, the modern way of exploring would be to have your ground control just the same as in Gambia, but with a professional surveyor and have aerial photographs to be able to extend your topographic detail over a much wider area, again, hanging on a triangulation network and so we had a very experienced professional surveyor.

[1:56:42]
But of course all the people on the expedition, well, certainly my level, being the most junior, were shielded from these government-to-government harangues or person-to-person harangues because I had had no experience and therefore was not involved in selection of
equipment. We had Kevin Walton, who died last summer, a civil engineer by training who’d been on the Falkland Islands Dependency Survey that later became British Antarctic Survey, and he’d taken a great interest in dog sledging and knew a lot about it. And so he was employed for some time by the Royal Geographical Society to decide what equipment to get for the British end of this expedition and he had very strong views about dog sledging and dog sledges, because he had driven dogs. But of course the Norwegians who are born to snow also had their ideas and these differences could not be ironed out so that we had British made sledges and Norwegian made sledges - and the Norwegian ones were better, as you might expect – but compromises had to be arrived at with things like tents and clothing and in fact tents were British, clothing was bits from each country. Furs from Norway because they had Spitsbergen and therefore could get polar bear skin, fox skin, wolf skin clothes which were very traditional, although they’ve gone out now, half a century later they’re not used. And so everything was argued by trying to assign a particular department, food to a particular country, but when the other countries found out what they were going to get for food they said oh, this is not good enough, we want our traditional food. So there was a lot of argy-bargy which the committees had to smooth out and a certain amount of duplication, but in fact the duplication of sledges didn’t matter because some of them broke and we needed spares. And the food was mostly Swedish, mostly Swedish selected, but also some British and the British produced a substance called pemmican which was traditional polar food: a mixture of finely ground meat with a lot of fat and that you melt into soup. And there’s a formula for dogs as well, so dog pemmican, made by Bovril it was. I don’t think they make it any longer even if you ask them to. But Bovril pemmican we had, bought considerable supplies of man pemmican and dog pemmican because otherwise the only lightweight foods the Norwegians could supply for travelling were stockfish, that’s dried codfish, dried in the open air in north Norway. And we had sacks full of that, bales they were, tied together with wire. And so we had both, and the dog pemmican was limited in supply because it was expensive, so we supplemented it with the stockfish. But also we needed even more than that and so the whaling factory ship gave us some whale protein, that is meat, dehydrated meat ground up and it came as a powder, and that was just being experimented on at the time. Perhaps the whalers saw the writing on the wall about overfishing, which they certainly were, and that they would have to get more out of the industry as the whales declined. And so we were given, there was a test piece of equipment on board to produce dried whale protein into a sort of powder. And as it was an experiment they gave us whatever we wanted, which is so many sacks of this stuff, and we had to use it
for making up dog food. We also had whale oil which they’d given us and we made up our own dog pemmican. Well, it had never been tried, whale pemmican, and it gave the animals diarrhoea and so for two years our dogs had diarrhoea which was when they were on that rather than on anything else and that was a serious problem. When they were on the pemmican they were fine, on the stockfish they were fine, but the homemade whale pemmican, it gave them diarrhoea. Yes, what else?

Could you, I realise that especially as you said that you were the youngest member that you didn’t get to hear much about these differences that were happening pre-trip at the kind of committee level, but would you be able to sort of characterise the different cultures of national exploration that the three countries were bringing? You’ve said that each tended to favour certain kinds of clothing, food, equipment and so on, but had to make some compromises in order to be an international expedition rather than just three national ones glued together. Could you, I wonder whether you could characterise the distinctions between a British, a Norwegian and a Swedish national culture of exploration?

[2:03:47]

Well the British had ideas on clothing descended from Scott and Shackleton, although rather than furs the prevailing outer layer at the time was a windproof, which is very tightly woven cotton garment, and to use simple sweaters underneath and to be able to peel off layers as you got hot, which meant taking off your windproof and then taking off a layer of wool and then putting it back on again, which was rather awkward. And that was what we contributed. The Norwegians, coming from a cold country and having Spitsbergen in their territory knew a lot about furs and we had reindeer fur sleeping bags, we had reindeer parkas, outer garments, we had reindeer boots which the Laps make in Lapland, and of course Lapland extends into Norway, Sweden and Finland so they, that tradition you can get anywhere, although the Laps generally make it only for themselves but they were bribed into doing a lot of making for us. And so the Norwegians were, Norwegian tourists would have windproofs in those days but working people, travellers in Spitsbergen would have furs, and so we had the furs available and the windproofs, windproofs and woollies available. They say Norwegians are born with their skis on, which meant they could all ski and they had strong ideas about skis and ski bindings. That was fine because the British couldn’t really compete and the British solution to ski-ing horizontally was to put you inside boots which were
attached to the skis and they were soft boots, so they were called soft bindings. Well, you
couldn’t control them as precisely as you could with where your boot is firmly fixed to the
ski, hard binding. And so we had two people who’d been on the Falkland Islands
Dependency Survey and so they automatically said we must have the soft boots that are fixed
on to the skis, so they were supplied, but the Norwegians and Swedes wouldn’t touch them.
They said we have our own traditions, and indeed the boots that I preferred throughout my
fieldwork were ones closely derived from ones that Amundsen designed and you can still see
them in the Ski-ing Museum at the head of the Holmenkollen Ski Jump in Norway. So those
were copied from that; they were leather and felt, thick felt and therefore nice and warm, and
they were fixed to the skis with normal hard bindings at the time, although being cross-
country we didn’t fix the heel down as you would for downhill, we were walking on skis and
I don’t think we even… we might have had a hook on the wire binding where you could
hook the heel down, but since we didn’t do any downhill ski-ing, we didn’t need to. And so
most of the skis were Norwegian, ski bindings Norwegian, ski boots Norwegian except for
the two British who said oh you can’t use hard boots, you’ll freeze to death, which the
Norwegians laughed at because they had a lot of ski-ing experience themselves [laughing]
and weren’t going to be told how to behave by the British. And the Swedes are also pretty
fresh air people who had skied and travelled in snow, they had their own ideas. But I don’t
remember much Swedish equipment coming. The principal thing the Swedes provided was
the food and the main huts were Swedish built. Incidentally, because of a cargo manifest,
everything that went on to the ship was minutely listed and I still have a copy of the full list.

*Really?*

I think several of us have because we needed several copies to tally off when moving from
place to place and to make sure everything had come and it’s quite an interesting list and I
can show you that.

*Mm, yes please.*

[2:09:35]

And so I was not privy to all these because, realising how unqualified I was to be assistant
glacialogist – incidentally there were, as far as I know, on the shortlist only three volunteers
for this job which was required to find somebody British because we had Alan Reece who was British, Fred Roots who was Canadian and me and then one more was taken on at the last minute, radio operator of the Royal Air Force group who had come down just for the summer. He stayed over and later was one of the ones who was drowned. And so each of us went on courses to prepare ourselves for what we were required to do. Well, I went twice to the mountains in northern Sweden, Kebnekaise, the highest mountain massif in Sweden, for practical training with Valter Schytt who was the principal glaciologist and my boss throughout the time. And one in winter and that was an eye-opener because it was minus forty degrees we had and, as you do in Lapland in the winter, and I remember that having been on two or three ski trips; one to the Pyrenees, one to Switzerland, I was okay as an amateur in downhill ski-ing, but this was irrelevant to crossing large distances in the Antarctic with dog sledges. And so we started off the last fifteen miles to get up to this mountain research station which Valter Schytt had set up, was without any road or track and it was in a snowstorm in winter, early March. And we started off as a group, I can’t remember, perhaps a dozen people, some Laps and some Swedes, all of whom knew how to ski on the flat. And I was clearly dragging behind and as it was a blizzard nobody thought it particularly nice to be out, they wanted to get a move on, not wait for me. So they asked a Lap to stay with me and come on at my speed and although he didn’t have a word of English he taught me more about cross-country ski-ing than anybody could have, by showing me.

He was the – you described him as ‘an ancient Lap’ in the book.

He was an old man.

Could you summarise what he taught you in terms of the horizontal ski-ing?

[2:12:51]

Yes I could. If you look at any British person who’s gone to Switzerland ski-ing and going the hundred yards to the bottom of the ski lift, you’ll find them pushing their skis out ahead as you do when walking, whereas the easy way to cross country when you develop your muscles is that you push your ski ahead but not much ahead, because you are leaning forwards and you push it a bit ahead, and then the back one you overtake and slide on that, so you extend the length of your pace enormously by sliding. So you think you’re stepping
forward, but the slide is the secret because you’re doubling the distance for each pace. And that has to be taught and so he showed me and told me that you… showed me that you must lean forward and that you drag your ski behind you and put it a bit forward, but it’s dragged from the back, not pushed out in front, except as part of the sliding. And I was eternally grateful for that. The other thing I remember is that in a summer trip later there were a lot of mosquitoes and I slapped one of them on my arm and the Lap with me said why do you do that, he has a right to life as well as you do. And they’re all immune to mosquito bites because they’ve been brought up with them and think nothing of it. But then during the winter trip, which was memorable because we were up on the glacier on skis all the time and sudden weather could come up in the mountains, and we had a blizzard which came up while we were up on the glacier and was recorded at forty metres a second, which I think is more like eighty knots, very difficult to stand up in; you’ve got to lean into it and of course you’re very unsteady on your feet. And we were coming down a steep slope which you would normally ski down, but were just blown over so we took off our skis and we were wading in deep snow and I was slipping around so much eventually ended up with my skis over my shoulder, holding hands with my boss as we staggered through the snow supporting each other back to the huts in the valley. I remember that memorable occasion and that was weather that in the Antarctic where you’re close to your camp equipment you would never dream of being out in blizzards like that because you could so easily get lost. But there we only had a short distance and he knew very well and so his instinct got him back to the huts alright. So it was a good toughening up experience.

[2:16:26]

And then we did a Weasel driving course by the Army. Now, Weasels were World War Two tractors of which we had acquired three from the Army I think, and driving them was very simple, like tanks that you brake one track in order to turn it the other way so you just have two levers. And maintenance we were taught by the Army and going from land to water, because they were amphibious, and simple maintenance we were taught by the Army. Then they were loaded on to the ships, so that’s the last I ever saw of them until we got to the Antarctic. Well not the last I saw of them because we took them on the whaling factory ship but didn’t have anything to do with them, they were just cargo. And then I obviously needed, we were going to examine the crystal structure of the ice. This had never been done in terms of drilling a hole in the Antarctic and we were intending to go as deep as we could and take microscope sections to study the size of the crystals and the orientation, because it was believed that as you went further down the crystals would realign into a preferred orientation,
c-axis vertical, which was around vertical. But that was not known and so we were making microscope sections and I didn’t know anything about crystals, so I went for a short one-man tutorial by Max Perutz who was a crystallographer and that was fun, I remember. So I still have I think the textbook that he gave me to read, but I didn’t have much to do with him but he told me how to prepare and that was very useful because when we came to microscope cross-sections and making thin sections I knew what was involved, but my boss had all the equipment for doing this. And in practice we took turns because in order to make, study microscope sections without melting your ice we had to do it in a cold lab which we had dug out of the snow. The temperature there was minus twenty during the winter when we were doing most of the drilling. So we were doing our work with a down suit on, but had to have the tips, at least the tips of our fingers free to turn the knobs on the microscope, so there was a limit of how long we could do, perhaps an hour you could do, before we retreated indoors to get warmed up and the other one of us went out for an hour. And we took turns like that to do all that work, which was important and when it came to write up the results that was done by Valter Schytt and we split the writing up of the results afterwards. But that’s a later story because at the time there was no split between me and my boss because it was assumed that as he was the only qualified glaciologist he would write it all up and get his doctorate out of it.

[2:20:45]

And as it turned out we achieved so much in two years that when we were going home he realised that it would take him ten years to analyse what we’d discovered and that was eating into his career, and so offered to give me some of it and I was of course delighted to have some of it and to write up, to publish, because we had a tame publisher lined up, the Norwegian Polar Institute, and so I was eventually given half of all the different subjects that we’d studied to write up and that was my DPhil thesis in Oxford. And that I sailed through because I was interested and I was capable of writing. I certainly wasn’t probably capable of analysing the survey or the physics of ice, but the survey I didn’t have enough mathematics either. It was very precise, I mean we were measuring with a hundred metre steel tape to accuracy of two millimetres, taking the temperature of the tape because of expansion. It was a very accurate initial survey, but then deformation, the ice was deforming and we measured it a second time so we had the movement of every one of the markers we put up. But that involved more mathematics than I knew how to analyse that in terms of strain, surface strain patterns. But luckily as it was a geographer and a geologist who examined my DPhil thesis they were not too critical about that part and I always had this, I don’t know, from school
probably, ability to write English so they didn’t have to say anything about the English and I took chapters in. My supervisor was Kenneth Sandford in the Geology Department. The geographers, when I applied after I came back, they said well, you were doing ice, that’s not geography. And so I went along to the Geology Department and said well, you know that ice is a crystalline form of rock and although you’ve never had anybody come into your department to do it, it’s a sensible place. And so there was a reader there, Kenneth Sandford, who took me under his wing and as I wrote different chapters of my thesis I handed it to him for criticising, which he did. But he didn’t have much to do with the writing of English because I could write English alright at the time, but he told me what aspects to bring out. So that that was very easy, I was working totally by myself with the classical expeditions to compare. The only background we had were the Scott and Shackleton expeditions to compare notes with what they had observed, so I went out and bought their books because even the Bodleian Library in Oxford didn’t have some of them, but you could buy them and I did and that’s the basis of my polar library, is things I needed to write my thesis. But I read whatever published papers I could from the Byrd Expeditions to the Antarctic; they had one in which they some glaciology. And so at the end of that, handed that in and it passed and I was therefore given a DPhil and the great advantage was, the Norwegians who felt responsible for publishing the results to show that their money had got the results said they’d publish it. So that each of my chapters I gave to Valter Schytt to approve of and to anyone else I could who might criticise them and suggest improvements, and I did. But then the manuscript was taken by the Norwegian Polar Institute and published as it stood. So I was very lucky, I mean very few people get their PhD thesis published in full and they have to take individual papers out of them, but we were all lucky in that respect that it was part of the Norwegian prestige to show that they’d produced a lot of results. But that was a great privilege for me so you could say that I was handed my DPhil on a plate because most people… and also I was, with the connivance of Kenneth Sandford, bypassing the rules which are that while you’re doing research you must be registered as a research student in the university you’re going to submit in, that was a normal situation so that they get their fees. Well I’d been in the Antarctic without any idea that I was going to write this up for a degree and so Kenneth Sandford was a great ally in arguing with the university the uniqueness of my case and it would be stupid to stop me from doing it because nobody else had done that bit of work. So that was very nice, so it was easy.

[2:27:44]
And then after that, okay you’re out on your ear in… there were no careers in glaciology or indeed in polar research at the time. The normal thing with the classic heroic expeditions is that you did your two years and then employment ceased and you were out, you had to find a job. And this was the pattern of the British Antarctic Survey when I joined. You did two years, if you’d done some good work you could be paid for up to three years to write it up for publication, five years total, and then you were out, had to find a job. Well that was the position at the time, so nobody had ever made a career of polar work. But I had so loved it that the four – or was it three – the British members, at the end of our two years actually exchanged telegrams with the organising committees saying we would like to stay a third year because we are getting such wonderful results, particularly in the ice depth sounding, which hadn’t been done before. And we wanted to stay, it was just, I don’t know, chance or enthusiasm that it was in British members who wanted to stay and not the Scandinavians. But we were turned down on the grounds that it would involve an extra ship charter the whole way to the Antarctic and back, it was a lot of money. And so we were brought home, but we were that keen and therefore when I got my DPhil I was that keen on carrying on, although there was no help available to do it and you had to find a job.

Well, just by chance at that time the Canadians wanted somebody to study pack ice in the Northwest Passage with a view to shipping and couldn’t find a volunteer in Canada so they went to the, asked the Scott Polar whether there was anybody from this country who would do it. Well that just coincided with when I needed a new job, so I immediately signed on for that, it was a two-year contract, turned out to be four years and I had to convince them that I was not wasting my time and that it was a big job that needed four years. And it was lovely because I was left free to, with help from anyone I could get, devise an analysis technique and then travelled around all of north America and Denmark getting records of ships that had been in the Arctic. It was a little ahead of aerial reconnaissance, just beginning at the end of the period. I was asked to analyse the first half of the twentieth century only because they wanted to know whether there were trends and there should be enough experience in half a century to know how it varied from year to year at different places. So it was a wonderful job because I spent a year and a half in Canada, again, controlling everything, deciding everything myself, going to where the records were, driving in a Ford van which I bought in this country just after coming back from the Antarctic, cost £400 brand new, which was a year’s salary in the Antarctic. And driving around with cases of maps this size of Arctic Canada to plot the results on. I can show you that, I’ve got a copy. And that lasted four
years and then there was this chap who you will have read about in *An Alien in Antarctica*
who came over and went on a pub crawl and at the end of the pub crawl he said, ‘Charles, if
you ever need a job, let me know’. Well, after this four-year job was done I didn’t have any
job and I remembered the conversation and phoned him up across the Atlantic and he said,
‘Yes, I remember that conversation’. And I said, ‘Well I’m now in the position of needing a
job’ and he said, ‘Well, give me a week to rustle up some money and then I’ll get you over
here’. Well he was what Americans called ‘an operator’ [uses American accent], he knew
how to work the system and get a salary for me in the space of a week, was brilliant, which
he did, and a good salary too.

And so I sailed over there and was at the University of Michigan for three years, and had a
very happy time there and went twice to the Antarctic under their – no, three times – under
their auspices and the first time was on an expedition organised by the man who had invited
me over, Jim Zumberge was his name, and the two subsequent ones I was left to organise,
run, get the equipment, sign on people and negotiate with the National Science Foundation
over what was needed for the project I had. Well, in those days people with substantial
Antarctic experience who wanted to go to the Antarctic were few and far between because
the Byrd expeditions generation were getting too long in the tooth or were dead, and so
whereas in earlier years there had been perfectly reasonable number of Americans who
would have gone again, too long had elapsed since 1934 when the second Byrd expedition
came home [coughs] for there to be keen people. And so with two years’ experience in the
Antarctic they considered me an expert, which was very useful because they left things to me
to organise and the transport; I bought all our own sledges – from Norway, naturally, having
learned – tents from England having learned that, sleeping bags we were able to get ex-US
Army ones cheaply. And then lightweight rations, the Americans had never done any since
the government started, since Byrd, they’d never done any lightweight travel where weight
was critical, they’d used heavy tractors where the weight of the food was a negligible part
and so they’d gone for ordinary tinned food in travelling, whereas I realised that the distance
we could cover in the course of the work depended on having light loads and therefore
sledging rations as developed by the British was the answer. But it was fairly simple in the
1930s, the British Graham Land Expedition was one of the founders of the Falkland Islands
Dependency Survey pretty well copied that expedition and British Antarctic Survey copied
since, so it wasn’t much changed. But I had lived with that on the Norwegian-British-
Swedish Expedition using those rations and found that you didn’t lose any weight and you
had adequate nourishment. So I built up, made a list of the rations I wanted. It was
traditional in Britain to pack man rations into twenty-man-day boxes of a certain size, and
still is even today, and so I… you choose dehydrated food because of course food back
home, water is the principal component by weight and so it’s got to be dehydrated. And I
based it on the classic British sledging ration but with improvements, realising that
Americans are more fussy about food than the British, because we’d all been through
rationing and so on. And physically made up all the food boxes with the people I had then
recruited. Now I chose to have three people with me and since we, the project was
measuring the rate of movement of the large valley glaciers coming through the
Transantarctic Mountains, some of the biggest glaciers in the world, which was something
which was people agreed was needed at the time. And so I had to recruit three people. Well,
it was obvious one of them should be a topographic surveyor because we were going to use
classical theodolite survey to measure and of course without a baseline to hang it on that
would be useless. So I went to the US Geological Survey in Washington and said have you
got a surveyor who’d like to come to the Antarctic, and one of their people said yes and they,
Geological Survey were and have been ever since responsible for the mapping of Antarctica
from the American point of view. So they willingly contributed a surveyor, a salaried
surveyor and no charge to my project. And then the National Science Project had files on
people who’d written out of the blue saying “I want to go to the Antarctic, have you got
anyone who can employ me?” Well I went to Washington and went through piles of these
files and chose who I would like and they duly accepted because they wanted to go to the
Antarctic for more or less anything. And so I ended up with me, an Antarctic professional
surveyor [Thomas E Taylor], Jack Tuck who had been the first winter at the South Pole. He’d
been one of the two leaders, the military leader at the South Pole, the first year of the South
Pole American station existing, and the fourth I found locally in the University of Michigan
who was a palaeontologist from a few hundred yards away in the Palaeontology Department.
So I had my four people then and the project finances which came from the National Science
Foundation were sufficient to pay these people. I didn’t need pay because I had a post at the
university. And so I had my party of four. I had best part of a, well, six months to organise
my equipment, buy these things from abroad, and as I was experienced they didn’t question
what I chose and this was an enormous advantage to getting … they could have said why
have you got to get sledges from Norway, we can make perfectly good ones. But they didn’t,
they trusted me and I’m very glad they did because I had very good equipment.

[2:41:14]
And so the first year was with the equipment provided by the party that Professor Zumberge had organised, so I was just one member of that party. But shortly after the start of that, we’d only been travelling a day or two, he got a bladder infection and that’s not a good thing to have when you’re in the middle of the Ross Ice Shelf with pretty poor radios, and decided it would be safer for him to go out. Well, I had two years’ Antarctic experience behind me so obviously would take over in charge of the thing. And we had a party of four as I remember it, it would have been five with Zumberge but we carried on with four. Crossing the Ross Ice Shelf, measuring by sun sights, setting out a line to repeat it a year later, to measure the rate of movement. Well, that was his project. Then my project which I proposed was measuring the speed of the biggest valley glaciers in the world and I organised everything for that, as I say, the equipment, the food, everything, and the Americans were incredibly tolerant and accommodating, can’t speak highly enough of them. And went down and that involved two measurements because all you could do is take angles to your markers out on the ice once and then go away to give them time to move and come back a year later and find the markers and survey the same markers and with the benefit of a baseline, intersect them and work out the movement. Well that I did and it was published in the leading science journal in America, Science. In fact I had a cover picture on a number of Science accompanying the paper [Science, Vol.141, No.3580, 1963, p.523-524]. So that was three years of my life and when you want to get on to the next stage you can if you’ve finished asking about that.
Okay. Could you please say as much as you can remember about what I know was a short course, and that is the very short course that you had with Max Perutz on the sort of the structure, the internal structure of ice. So anything you can remember about him as a person and about what he taught you and how.

Well, in time it was probably a couple of hour long interviews and him telling me what I should read, that’s all it amounted to. But he was a keen glaciologist and that had been his early interest and I don’t think at that time, although he was employed probably by the MRC, I don’t think he was considered anything special because he hadn’t made any unique contribution at that time. So we felt at ease with each other because we both loved glaciers and that’s about all I remember. But I took the textbook to the Antarctic with me so that I could look it up. No, so I don’t remember more. When he retired, when he realised that his life from then on was going to be structure of, molecular structures, he gave me all his collection of off-prints, glaciological off-prints and I’ve given some away to the Scott Polar since then and some to the Glaciological Society. I probably still have a few.

Do you remember the name of the textbook that he recommended that you read and the one that you took?

No, it’s in my shelves somewhere, but don’t want to waste time now looking for it, but I probably can.

Thank you. Could you say as much as you know about the origins of the expedition, the Norwegian-British-Swedish Expedition, in terms of the official sort of stories around it and what you might have picked up about the sort of geopolitical significance at the time? Now the story that I think I’m, well that I’ve got from reading your book is that Professor Ahlmann at Stockholm University looked at the published account of a secret German expedition, the published account was published in 1942, which contained in it aerial photographs, and the story from the scientific side is that he thought that exposed areas of rock in those photographs indicated that ice might be retreating in Antarctica as he had
discovered it was in the northern hemisphere based on his own research and so decided that there ought to be, to follow this up, an expedition to this particular part of Antarctica at this particular time. So there’s various issues here which perhaps you can help me to explore. One is around concerns about ice sheet melting. Now in terms of narratives of climate change, that seems quite an early concern with ice sheet melting, so let’s tackle that first.

It was early because he had reported on a number of glaciers: Greenland, Spitsbergen in Norway, Sweden, and found them all, well the majority retreating and so something was clearly going on and he published this. I’ve got books by him. And so this was widely known. But at the time nobody had even thought about whether anything was happening in the Antarctic in the long term and probably a lot of people didn’t know how to recognise signs, but he was a geomorphologist and he really recognised the signs of what looked like glaciated landscape, which was sharply defined, not smooth – well smooth in terms of glaciers come over it - but not since being ice-free, recognised the signs, which I think anybody who’s done a bit of geomorphology should recognise. And so immediately thought well, is this climate change a global phenomenon or isn’t it, and you couldn’t find anybody who could answer that question as far as the Antarctic is concerned, nobody really thought about it. And so that for him was a prime interest and I’ve got press cuttings saying that we were going to study climate change, press cuttings from 1949, and of course people think it’s a newly invented subject, but far from it.

Were there people other than Professor Ahlmann at the time who were expressing concerns about climate change?

Not that I knew of. You see, after we came back and America became prosperous and many people studying glaciology, the Americans had a lot of expeditions in South America: Argentina and Chile, and they too found retreat and New Zealand, published work in New Zealand, published work on tropical glaciers on Kilimanjaro and Kenya, and Ruwenzori and New Guinea, there are a few glaciers. And so people homed in on those and looked at those and certainly in the Andes there’s pretty drastic retreat. I mean there you’ve got a row of glaciers or ice caps on volcanoes going the whole way up South America and so there are people, particularly American who… Lonnie Thompson who has worked on that for his lifetime and got all sorts of awards through publishing what’s happening and working physically, hard labour at 6,000 metres above sea level. Not what I’d choose for sport but
getting extremely good results on climate change from the ice coring. So yes, it’s after that
time that the interest really spread, but Ahlmann was the first to say is this happening in the
Antarctic?

[0:08:16]

*How were the scientific aims of the expedition communicated to you and to the other ex…
other people on the trip, on the…*

Well I think as far as glaciology was concerned, it was just summarised in a paragraph or two
which I’ve quoted in my report of the expedition. Very straightforward things that we should
look at. The other scientific aims were well, filling in an enormous blank on the map.
Meteorological, in terms of weather stations we were more than 2,000 kilometres from any
other weather station and as far as the worldwide weather watch is concerned, I mean, you
know, you pool your results by radio from everywhere and here was this great blank on the
map. And it affected whaling in the Southern Ocean, that absence of knowledge and even
weather in South Africa and South America. So they were keen to know that. And then
geology, well again, it was an enormous blank on the map and by then it was accepted as
possible by that time that the Antarctic had been connected with the other southern
continents, but only a possibility and now everybody would say it was. And so geologists
were looking for similarities between the geology we found and Australia, South Africa,
South America.

*So how would you describe the relative status of the climate change ice retreat concerns to
these other scientific interests of mapping, collecting data on other things?*

Well they were equal, two people each. And so only one surveyor but then he needed an
assistant but then he could use anybody, any spare man and the doctor of course was a spare
man for field parties because we always felt it was more likely that we would get into trouble
and need a doctor than the people at the base who had no outside activities except every six
hours going outside to read the weather. And so the geologists, the geological party of two
people and the glaciological went together some of the way and then split up to cover more
territory and then rejoined again. And we couldn’t rely on the radio, we had radios, you
couldn’t rely on them so we’d agreed a rendezvous in x weeks’ time at a certain place, and
that worked, that worked very well. Just maximise your spread of what you were looking at in measuring ice movement, measuring, digging pits to determine how much snowfall you had every year and looking at the geomorphology, what indications there were of recent retreat. And there weren’t actually signs of recent retreat, by which I’m talking about the last century or so which is what had happened in the northern hemisphere. There’d certainly been a lot of retreat before that, in other words the ice sheet had been a lot thicker at some time in the past, perhaps at the last glacial maximum, 20,000 years ago. And so there’d been a lot of retreat since then but that was not the same as the contemporary twentieth century retreat that we were told to look for and we didn’t see any sign of that. But it was inland and the mountains were 200 miles inland [coughs] and you’d expect that [clears throat], you’d expect that retreat would start near the sea because you’ve got the sea warming, the ice is warmer, the battle between the sea temperature and the ice is immediate and relevant because so much of the coastline is ice going straight on to sea with nothing in between. So it didn’t horrify us but was considered a very useful result that we didn’t see signs of ice retreat.

[0:13:31]

*And can you tell me what you gleaned at the time about the geopolitical aims of the expedition?*

Well, a lot of people have come out since, even very recently, with the celebrations of the fifty years of the Antarctic Treaty, which we should come on to at some point, have been raking over this and of course if you’re training in politics you’re going to find a political background to everything. But we on the expedition were, certainly at my level, were completely unaware of the political background except that it was obvious that the Norwegians wanted to stake out their claim, they’d made the claim but they hadn’t done anything because there’d been a war in between. And so in international law you have got to occupy a country that you claim sovereignty and of course in the Antarctic claims based on effective occupation are pretty tenuous because people were only come there for a couple of years and then go home. But anyone who’s interested in geopolitics has always found reasons for explaining what I didn’t think of at the time, that geopolitical aspect and it was very sensible from their point, Scandinavian point of view to have Norway and Sweden together because the Norwegians, well did not admire the Swedes because they thought they should have joined the war and they didn’t, they escaped, and indeed they were assisting the
Germans at some times, but also later assisting the Norwegians who crossed the border to harass the Germans. But because of that there was no love lost between the Norwegians and the Swedes and therefore geopolitically it was good to try and bring them together on a common endeavour shortly after the war when these hard feelings still existed, but we were not politicians, we were scientists and therefore it didn’t bother us. But I certainly detected with the Norwegians, resentment of the Swedes if you ever got talking privately about these things.

[0:16:26]

*Could you think of any examples of that that you remember, of the… examples?*

I remember the Swedes boasting about how well off they were. I mean we’re not talking about the war at that stage, but just the way people boast of what they own back home and the Swedes obviously had more than the Norwegians. And so probably talking to Norwegians, they were more careful and I hope they would have picked up on the fact that the Norwegians… the Swedes looked down on the Norwegians as being peasants and fishermen and therefore lesser men than Swedes who had big manufacturing industries like Saab and the Norwegians didn’t have anything comparable. I mean when I was, after the expedition, there in 1953 the Swedes had the fourth largest air force in the world. People will have forgotten that, but it was at the time. And I was there on some national celebration in Stockholm and there was an air show with 500 aircraft flew over the city and this in a small country like Sweden, because they had lots of money from the war, benefiting from selling ball bearings to both sides and collaborating, different Swedes collaborated with the Germans. But all the same time having great sympathy with the Norwegians and realising how easily the Germans could have come in and taken Sweden. I mean a few days, the Swedes would have put up a fight but it was only after the war they realised the Cold War was coming and Russia was next door and Russia had taken over Finland in the Winter war in 1940 and could just march in and they’d better be able to defend themselves. And that’s why they had very good air force at the time and a pretty efficient army that could have fought in mountain terrain better than the Germans. So they would always say well, they were afraid of the Germans coming in any minute. But we didn’t talk about these jealousies on the expedition except individually when you were talking to a Norwegian or a Swede, for obvious reasons, we didn’t want to cause any upsets, hard feelings. And so we were always
very conscious of national sensitivities like that and if I’d boasted that I thought Scott was a better man than Amundsen, well I would have been shouted down by the Norwegians. I wouldn’t say that because I’m a great admirer of Amundsen. But it was very important that we hid or suppressed all arguments related to nationality, and we all accepted that and I think we observed it so it was always discussing nationalities, it was always off the record between two individuals. I mean my field assistant throughout the two years was Peter Melleby, Norwegian, and we had a lot of discussions about things like that and what Norwegians thought of the Swedes. But the Swedes looked down on the Norwegians as being poor relations, which they were. And of course, interesting now in the last half century, the thing has switched and Norwegians are rich and the Swedes less so. And I read on the news last week that Saab is stopping manufacturing. And when I was there in 1953 they produced some of the best jet fighters in the world, the cars were a later addition. But SAAB stands for Swedish Aircraft Company in Swedish. And so they were, had very, very profitable industries whereas Norwegians had the fish and shipping. Fish and shipping were what Norway lived on. Farming, simply peasants having an acre to themselves and that was not much economic significance.

Thank you. I wondered whether someone like Nils Roer – am I saying that name…

Roo-er, pronounced.

[0:21:08]

Who was a surveyor on the trip but he’d been in the Norwegian Resistance Movement as well, and you were presumably, you did presumably feel freer about talking about nationalities which weren’t represented on the trip and I wondered how he viewed his science being only a few years after he was fighting against the Germans, working in an area that the Germans had wanted to claim, working on something like surveying with obvious military connections, how he viewed the importance of his work in relation to that?

Yes, I mean there was no military significance in surveying the Antarctic, but no, the job of a surveyor is to map his own country and I think the Antarctic for him was just as it was for most of us, an exciting job, a challenging job. And his wife was not too keen on him going, leaving her for two years, but those of us who were married, I think there were four or five
married, were in the same position. Wives had to lump it or divorce them. None did actually.

[0:23:36]

You mentioned in your book that there were two observers: one from Australia and one from South Africa.

That was on the ship, the first season, they went back with the ship.

What were they, what was their role?

The, well you see neither South Africa nor Australia, are both southern countries, could afford to do work in the Antarctic but both had ambitions and therefore it was important to have an observer on the ship and so we had a South African meteorologist who got on well with our meteorologist because they all used the worldwide weather reporting system and he, the South African, had been involved with getting weather observations from the whaling factory ships to help his forecasting, which all had to be done in secret because the whaling companies, much as they wanted to report weather because they realised it was invaluable, it had to be a secret because they had to report the whaling statistics every day or every week to the International Whaling Commission, and they did and if you were killing lots of whales everybody would be interested in where you are so they can come and share the spoils. But their interest was in keeping it secret, so that the South Africans had an agreed code which the other whaling ships didn’t have. Each ship had its own code so it could communicate the weather. And so there was natural affinity there between the South Africans, the Australians and the whaling and us. And South Africa had ambitions but it was some time after that before they fielded an Antarctic expedition. The Australians had done work on sub-Antarctic islands, Heard Island and Macquarie Island and had been longing to go to the Antarctic. And so the head of their Antarctic outfit, Phil Law, Phillip Law, asked who was invited to come on the ship in the first year to see how things were done, although we were all new to it, he obviously could observe and talk to everybody and get a lot of useful ideas for going to the Antarctic which he did quite soon afterwards and the Australians have been doing ever since and they do it very well now. They’re even flying an airbus into the Antarctic from Tasmania and landing on bare ice. Again, this is all related to the bare ice that I pioneered
later. But to have a full blooded jet airliner going, it was something very exciting and they
do it several times, I think they do it once a week in the summer or something. But… so
that’s the answer to your question, the observers.

And finally on this area, how were the Russians viewed at this time by the various
nationalities on this expedition? I notice at one point in your book you mention that one of
the members of the trip looked a bit Russian and was called a Russian spy and I wondered
what was the general sort of, I don’t know, talk about…

No, that was only a joke.

Yeah, well of course, of course, but it indicates some awareness.

[0:28:21]

Yes. Well, the geopolitical situation was the Cold War and everybody being afraid of spies.
And it was in the light of that that the Americans thought it vitally important to have
exchanges between them, have an annual scientific exchange between a Russian and
American and they led the way long before I went and that was a government initiative. As
far as I was concerned it was like wringing blood out of a stone to get government interested
in me going, but it happened in the end because I’m persistent. But it was because in the
Cold War atmosphere the Americans could say well we don’t know what they’re up to, they
may be testing bombs, taking guns there, storing weapons and the Russians saying the same
thing about the Americans. And so it was important because we all were there for science,
although there are exceptions to that and that’s Argentina and Chile. But as far as United
States and Soviet Union were concerned, there’s no evidence that I’ve heard that there was
anything military going on. The Russians had far more interest, reason to be suspicious of
the Americans because the Americans had the military as their logistic arm to take people
there and to fly them around. And that’s only very recently wound down, they still have
some military there, whereas the Russians were entirely civilian. Mind you, a lot of them
were ex-warriors from the war, but they were civilian. And so there was good reason to allay
any suspicion that there was anything naughty going on and so that was very successful, the
exchanges, and I don’t think anybody worries about it now and there have been other
exchanges and I got this exchange with the Russians but I’m the only person ever to have
done it because although it was a success, it needs to find a volunteer to do it and there haven’t been others. So we were very aware of the Cold War, we were in the Antarctic during the Korean War and I remember we didn’t listen to much news. You lose all touch with the outside world because you’re concentrating on what you’re doing, but you occasionally listen to the news on the radio. And how utterly ridiculous it appeared that the Koreans, North and South were killing each other by the thousand. How absurd when the world was such a peaceful place and here we were, five nationalities living happily together. And that’s the only thought, but otherwise we didn’t have any thoughts because our mind and interest was on what we were doing there.

[0:32:09]

*Was there something about the landscape of Antarctica that made the reports of war from home seem futile?*

Yes. Antarctic was totally peaceful, the environment was peaceful, everything was peaceful, that there was no tension between our nationalities other than the hidden disrespect national stereotypes, which we didn’t talk about, naturally, and we suppressed any indication of them, but that’s all. We got on fine. In fact we got on better and better as the time passed by.

*Oh, you’ve spoken about the Norwegian and Swedish views of each other which they were able to conceal in order to get on day-to-day and that sort of thing, what do you suspect or what did you know to be the view of the British contingent from the other, from the Norwegians and the Swedish, how were you viewed as a nation?*

I don’t think they had any preconceived notions except that we were all aware that the Swedes had cleverly avoided getting into the war, we were aware of that. And we were aware that it was a very sensitive subject for Swedes to talk about, so we just didn’t talk about it.

[0:33:44]

*Thank you. Could we now talk in detail about some of the particular scientific practices that you were involved with, and I’ve got a bit of a list here. So if I could start just by showing*
you this picture which is from your book, which is you at a piece of equipment, I wonder — which we can link to this recording — could you, if it’s too difficult to remember that particular memory, fine, but if you could, could you talk me through what you’re doing there step by step, including the problems that you mention with wind and how that prevented you, but could you tell me what you were trying to do there?

I remember very vividly that we wanted to know the mechanics of an ice shelf, that is a big floating glacier, and how did it move and how did it deform in the course of moving, which is what has been done on local glaciers in Norway and Sweden, and here was a big unknown, this big large sheet of ice, obviously flowing towards the sea, although we had no fixed points to measure from, but it was obvious from looking at it that it was flowing towards the sea and breaking off icebergs at the end. And because the mechanism of an ice shelf, what controls its thickness was unknown, we wanted to know its thickness, which we found out by seismic sounding, and then we wanted to relate that to how it was moving, how it was being affected by the sides, the friction along the sides of the thing and whether it was moving as a block or whether it was deforming. So this was a study, the deformation of the ice shelf.

And we set out, Valter Schytt and I set out a pattern of six lines as I can remember, three kilometres long, with one aluminium stake every kilometre, and six threes are eighteen, something like that number of stakes. And having put them in we could get the angles easy enough by standing at the centre and taking angle with a theodolite, which is what’s going on here. But then the exact position, apart from out on line, could only be determined by triangulation so we made a very accurate baseline, either one or two kilometres long, and then observing from both ends of that, intersected all the stakes, established the co-ordinates exactly. So that was the starting pattern and then it would deform and two of us did the initial survey because we needed two of us, particularly with measuring the baseline, but it had to be done again, obviously, to establish how much the movement was. And that I did by myself, which involved going out — you see we had two comparatively short winters as our main interest was in travelling inland and answering those questions — and so the second summer, second, well spring and summer before the fieldwork, it had to be re-measured, which was a matter of simply re-measuring the angles and this showed how much it had expanded. And so we got all the answers we wanted out of that and could describe how it flowed and how it was held back along the edges by friction with the edges, but the second survey was entirely my own work.
So are you looking through the lens at the stakes in order to take the bearings? Yes.

[0:38:54]

Thirty times telescope on that theodolite and then the crosshairs, and so I’m aiming for the stake. I mean within centimetres. So very accurate down an accuracy of one or two seconds of arc.

Right. Thank you. The second particular piece of scientific work that I’m interested in your describing is the ice core work and you I know dug a cold lab so that you could take ice cores back into it and presumably view them so that they didn’t melt if you took them into a warmer environment. I’ve got a picture here of, this is Valter I think, looking down...

Yes, I took that.

... down the microscope.

Yes.

Could you describe in as much detail as you can how you actually got the cores, how you had to be, how you had moved them from there to the cold lab, how you stored them while they’re waiting to be analysed, how you cut and examined them and then when you were looking down the microscope, what did you, what were you looking for? So I’ll make that easier for you by asking you one at a time. Could you first tell me the exact process of getting the cores, drilling the cores?

[0:40:31]

This was a Canadian built Longyear rock drill and so the drill bits were more suitable for rock than ice because nobody quite knew what you needed for ice, but still it worked. The great problem was, as a rotary drill the core was breaking off very often and so you got in the core barrel, you got bits sometimes as little as that long. I mean when you got them out you…
That’s about ten centimetres.

Yeah, you could easily keep them in order when you got out and laid them out in the correct sequence, but it was annoying and when you go deeper down you get longer cores and nowadays people come out with six or eight feet or more. Not then, but that was alright. And then we sawed it, we had a very fine electric saw and sawed it across into perhaps quarter of an inch thick sections and then those we melted down to get them to... aiming for a thickness of less than a crystal so that you couldn’t see every single crystal in cross-section. And... I’m trying to remember how we did that, but it was so easily to get heat from an electric light bulb for example, that wasn’t difficult, and then you had to dry them off and make sure immediately you stopped heating them of course the thing would refreeze, but luckily refroze very tiny crystals that you could ignore because the original ones were much larger. And so we got it down to well, less than the size of a crystal and the crystals get bigger and bigger as you go down, but I suppose the first ones were about a millimetre thick and on a glass microscope slide with the glass cover slide which is even thinner than the slides because they’re not carrying any load, they’re just protecting the top from evaporation.

And looking down the scope, you look at the crystals, what did you, what were you looking for and how did you record it?

We had cross-polariser lenses, one above the sample and one below the sample.

[microphone dislodged?]

[0:43:46]

Yes, I was asking about what exactly you were looking for down the microscope when you were looking at the crystals and then once you’ve told me what you were looking for, how did you record it?

We... took a photo, cross-section, the slides about one inch square, they were. We took a photo but then in order to determine the orientation of individual crystals, we had a compensating system which... I forget really, but it allowed you to determine the orientation relative to the plane of the slide and there was an artificial refraction that you could add in
order to get, to determine the orientation. So I forget exactly how, but any geologist would be doing this all the time with a thin section of rock, exactly the same as you do with a thin section of rock.

[0:45:17]

*How would you make sure that what you pull out of the ground, when you get it back to the lab you know where it came from, which way round you should be looking at it, that sort of thing?*

Well it didn’t matter whether we were looking at the top or bottom of a one millimetre section, that didn’t matter. Orientation and horizontal plane was lost, immediately you got into the core barrel it was being twisted so you lost that, but we knew that the cross-section was horizontal. That’s about the only thing we did know about it, it was horizontal. And so by measuring the inclination of the crystals, you were measuring in relation to horizontal. That’s all and it was pretty straightforward.

*What did you do with the cores once you had examined them? Were they stored in any way?*

Some were stored, some were used for cooking in the kitchen because being much denser than snow it was easier to melt them. Snow takes a long time to melt because it’s got all the… it’s got all its insulation; air and so with your cooking, if you can use solid ice you use much less energy than cooking snow.

[0:46:56]

*Thank you. And using the results of this you were able to establish how the ice sheet is deforming?*

Yes.

*Because there were various sort of theories weren’t there, and how did what you collected help you to answer that question?*
All that analysing afterwards was done by Valter Schytt and it’s in one of the red-covered volumes there. So I, having done a lot of the lab work, didn’t bother to read it and I was too busy writing up my own work, but it’s all there and published.

Thank you. And the third sort of distinct kind of scientific practice that I’m interested in is the seismic sounding works which you seemed to be doing with Gordon… Robin?

Robin, Robin, yeah.

I wonder whether you could tell me, for example I know that I think it’s by the second summer you were going on a trip with the Weasels across and doing soundings at various points. Could you describe that particular phase or kind of work?

[0:48:13]

Yes, there were just three of us, everybody else was engaged in different things, and Gordon Robin had secured two of the Weasels. By that time one of the Weasels had driven over the ice edge and drowned three of our people and so there were only two left, so there was obviously competition. The geologists would have liked the Weasels because the Weasels could carry a much heavier load and the principle is to drive up with a two ton depot with a Weasel and then radiate out from there with dogs, starting off each dog journey with half a ton on the dog sledge. And so there was a little hard feeling with both the geologists and the surveyor that we monopolised the only remaining vehicles, mechanical vehicles for this long journey, but it was considered important that we… we were getting such exciting results in terms of ice much deeper than we expected near the coast and we obviously wanted to see whether it gets deeper inland, which it does. But also how even or uneven is the rock bed under the ice. And we did one seismic sounding every thirty miles and then travelled thirty miles. It took twenty-four hours to do the seismic sounding and the moving on because we had to set out six seismometers and dig little holes with a spade and bed these, which are essentially microphones, in the ice and lead wires back to the instrument which measured the timing. The difference between the time of an explosion you set off with sixty grams of TNT and the reflection from the bed, and this is a fraction of a second, you’ve got a very good sort of tuning fork and timers to determine that. And to set out all these, lay out all these wires, to drill a hole to set off the TNT, I was responsible for drilling the hole and making up the shot.
That took hours of work and then when Peter Melleby, who was my field assistant - well second season he was Gordon Robin and mine - he helped putting out the things and as soon as he’d finished that he would go in and start cooking supper while I drilled a hole to ten metres, about two inches diameter to put a thermometer down and Valter Schytt dug a two metre pit, about the depth of this room, and studied the strata, snow strata, from which if you’re lucky you can say that’s an annual layer and this is another year. It’s not always easy to interpret. And I got the ten metre temperature which is, gives you in one fell swoop the mean annual temperature of the air above the ice because the air temperature is sinking into the ice and being buried and when you… there’s an annual summer warming and a winter cooling, but as you go down those are rapidly smoothed out so that at ten metres the fluctuation between high summer and coldest winter is less than one degree. And so you are in a few hours measuring what it takes a meteorologist twelve months to get, which is the mean annual temperature, and they get it by measuring temperatures in the Stevenson Screen every three hours or six hours and I got it in one night. Of course I couldn’t tell how hot it got in summer and how cold in winter, but at least I got the figure for the mean annual temperature and the meteorologists were studying ice temperatures as well as air temperatures at the base, and so we had, afterwards we had the seasonal curves of the temperature and we could correct what I measured at ten meters with a few tenths of a degree according to what time of year I’d done this hole. So we got very accurate temperature measurements and that affects ice flow, so it’s interesting to lots of people. But the seismic sounding did take twenty-four hours for one shot and then we just drove on thirty miles and then did the same thing again.

[0:54:11]

To what extent did being able to get on and do the science depend on other things sort of playing the game, if you like? So how much did getting on with the science depend on the weather being right, machines functioning as you wanted them to, pieces of equipment holding together. I wonder whether you could, perhaps with one example of one particularly difficult time, or perhaps you might be able to talk generally. To what extent did you depend on all of these other things that weren’t exactly science but were the sort of back-up?

Well, we were carrying all our own food and we were carrying a radio, but the radio was so low-powered and so unreliable that we tried to communicate once a day, in the evening, but
quite often we didn’t get through at all. And the base were at times when they didn’t hear from us for several days running they got quite worried. On the other hand they had no possible means of coming out to look for us and so we weren’t worried, they were. And yes, I didn’t… where did you get on this line of thinking?

_I was wondering whether, at one point for example you were talking about trying to do some work but that the Weasels kept breaking down and you spent most of the week repairing them. I wondered whether sometimes equipment and weather got in the way of the science?_

[0:56:02]

Equipment breakdowns and Weasel breakdowns, we had to live with them and if a Weasel breaks down, well you don’t move on till you’ve fixed it. And none of us was a mechanic, but the Weasel drivers were responsible for keeping their own Weasels going and the… we had two problems: one is ice in the carburettor and so I became adept at taking a carburettor into the tent and thawing it all out and making sure that the jets were all clear, blowing down them, and this was quite common. What I didn’t learn until many years later is that the residual warmth in a carburettor after you’ve stopped often melts out the ice without you doing anything, and driving in the States when it was cold, my old Ford would seize up, obviously carburettor trouble, and I would stop at a garage and moan and say oh, what’s gone wrong, and after finish moaning you go outside and press the starter and it’d start again because the ice had melted. So we had this and so I probably dismantled more carburettors than I needed. But we were very anxious about starter battery power because we couldn’t hand-crank the thing and so everything depended on getting it going. So that, repairs and then on some stage on that journey we had a failed gearbox and we had to take out the gearbox, which is extremely awkward because you can’t get underneath the Weasel, it being amphibious. The hull is underneath the driveshaft and the differential and the universal joints. You’ve got to get them from above. Very awkward, but we did. As I say, none of us was a mechanic but the very simple compulsion was that if we didn’t get it going we’d have hundreds of miles to walk; so we did. And then just the same as Amundsen killing his dogs and feeding them to the other dogs, as soon as one of our two Weasels – we’re burning down fuel all the time – could carry the load both been carrying, in other words the load had halved so we could load them all on to one, we abandoned one and went on with a single one. And then we were totally dependent on keeping that one going. That was mine and I did and it’s
the one that we brought back to Cambridge and was exhibited in the Scott Polar Institute for years afterwards and eventually was turfed out because it was too big for the museum.

[laughs]

[0:59:34]

Okay, so if I can just take you back to the whaling ship, which is the journey to the Antarctic in this case. Could you say what you thought then, looking as you were at the whaling ship and the harvesting of the whales that was going on and now I’ve learnt, filming it, could you say what you thought of the ethics of this particular relationship between men and animals; the whaling industry?

At the time it was an industry in the same sense that raising cattle is an industry and you didn’t think of the ethics. If you argue that people shouldn’t kill animals, well let’s have an across the board ruling and don’t eat any more meat. So we didn’t really worry about that. We were aware that it was cruel, in other words the whales took some time to die after you harpoon them, but it was an industry and in industries where people’s livelihood depend on killing, fishing for example, doesn’t bother them, don’t think about it.

And what did you think about the amount of whales that were being fished?

Well, the world needed the whale oil for margarine and lubricants and cosmetics and lots of other things and there was a good market for it. I don’t think we thought about the ethics any more, as I say, than you can ask a cattle farmer why he’s killing his cattle.

Leaving the sort of the morality of it behind, what about your actual sort of feelings at seeing this happen? In your book you talk about a sort of sadness when you saw a foetus inside a whale, but this is a kind of sadness which is separate from you thinking about bigger questions of right and wrong, just a sort of personal sadness in that sight.

Yeah, well I think everyone would find the killing of a child worse than a killing of an ageing adult.
Yes. On the Norsel, I’ve read your description of this particular journey and there seems to be quite an interesting distinction between different kinds of shooting. For example, there is shooting of seals as valuable meat.

We had to do that to get dog food, yes.

[01:02:38]

But then there were sailors that you describe being told off by the captain and other people for sort of more silly shooting or…

Oh I remember very well a Norwegian who had no earthly need or use, just shot a blue whale because he was used to shooting at everything that moved, it was just his life and so it didn’t cross his mind as cruel. It may or may not have killed the blue whale, I don’t know, but blue whales were rarer than fin whales. So in my mind I’ve always had a distinction between killing for the hell of it and killing for meat for eating and this was just trying to kill for the hell of it.

And what about the status of seals and penguins as targets?

We didn’t take many penguins because there’s very little meat on them. Penguin breast is nice, but it’s a very small amount of meat because all their subcutaneous fat for insulation is in their fat layer and the meat itself is too lean, you really need to add a bit of fat when you cook it and our cook did, he devised a very clever method of putting bits of bacon in it to give it some moisture.

Do you remember seeing the penguins on board?

We didn’t have many aboard. I mean I think initially probably the sailors put one or two on board just to let everybody see a penguin because a lot of people had never seen a penguin before and they would wander around and were then put back on the ice. Of course they objected strongly to being caught and put up on deck, but as far as I remember we let them go. It was only at the base, Maudheim, that we did kill some penguins for the dogs and also to get some meat for ourselves, but not very often and we didn’t kill many.
No.

They were emperor penguins. I think you get put in jail now for shooting an emperor penguin but then it was perfectly alright. And the numbers were adequate, so we certainly weren’t affecting the stock.

[1:05:35]

No. In the book you said that you’d felt that you had become brutalised by all of the sights of blood on the deck and fat and blubber and things, so that by the time you got to Antarctica when you had to shoot seals in order to feed the dogs, the impression I got was that you’d seen so much of that sort of thing that you didn’t find it quite so alarming to have to do it yourself?

No. It was not alarming and it was cold work and it was a thing you could do by yourself because one of the Weasels hauls seals up on to the ice shelf from where they’d been shot on the sea ice probably, and there was a great collection of them lying there and you really needed to gut them straightaway while they were unfrozen and it only takes one person to slit it down the middle and put your hands inside and pull out all the guts. And in fact that was quite a nice sensation because you warmed your hands. You’d had to take off your gloves to do the cutting and to plunge your hands inside the abdominal cavity was warming them.

So it felt warm. What about the sight and the smell?

Well, it was ghastly, but it was necessary. No, I didn’t enjoy gutting anything, I never have, but you had to do it.

[1:07:19]

Could you tell me potentially about something, quite a nice memory compared to gutting seals, about your relations with the dogs on the trips?
All very friendly. There were only two dogs and they weren’t in the team I worked with who obviously had been brutalised in Spitsbergen and if let loose you couldn’t catch them. But all the dogs I worked with were pets at the same time and if they got loose you’d call them by name and they’d come up to you wagging their tail and you’d tie them on again. So you were great friends with the dogs and because you depend on them and they depend on you for food and they depend on you to be fair with them and give them the same amount of food and not to pick on any one, I mean they all show signs of indiscipline but you mustn’t pick on any one of them. And the only time I did, I described in the book how I beat one. Only beaten one dog ever and I felt awful for having done it because we depended on them.

*And how did you feel when you sort of came back from a trip without dogs, you know, to being with them again, was it…*

Well we had dogs on most trips. The Weasel depot trips we didn’t have dogs, although dogs had gone out ahead to find a safe route. Mind you, they failed and that’s why we got into a crevasse with the Weasel sledge, but that only happened a couple of times. But it was certainly safety factor to have the dogs out ahead because in a very thin snow bridge the concentration of the weight on one paw will go through if it’s a thin snow bridge and from then on you know there’s a crevasse there. But the dogs actually sort of sniff, can’t be sniffing, some other sense such as the sound of the vibration of dogs’ feet in the snow, they can often sense that they’re coming to a snow bridged crevasse.

*Might be a sort of hollowness that they can feel?*

Yes. Yeah, because there certainly is a hollowness and they’ll stop at the edge. Well, most often when that happened I could see the crevasse and we were intending to cross the snow bridge anyway, although at that point we always went up and started probing to see how thick it was, whether it’s thick enough to carry the weight. But I did occasionally have quite a hard job to get them started. Once we started crossing a wide snow bridge they were alright, but they knew it was something undesirable.

[1:10:57]
Thank you. And I don’t know whether you can remember this in detail, but if you can, could you describe the initiation ceremony that you had as you crossed the Antarctic Circle? It was on board the Norsel and it involved the sailors as well I think. A sort of initiation ceremony to mark the crossing of the Antarctic Circle.

The biggest one was on the whaling factory ship going south on the equator, because there were 400 people on board and so it was very elaborately organised with King Neptune dressed up and lots of sailors to make sure you were mistreated and shaved you and covered you in soap and then eventually threw you backwards into a small swimming pool. And everybody, great fun was had by all. But we weren’t thrown in the swimming pool crossing the Antarctic Circle because that would have been rather cold, but… [bell ringing]

[break in recording?]

[1:12:19]

Yes, could you describe what you remember of the initiation ceremony as you crossed the Antarctic Circle on the Norsel which seemed to involve animals in some way and I was wondering about the significance of that?

Frankly, I can’t remember. I do remember the equator crossing, but I… I took a lot of photographs of that but on the Norsel I don’t think I did. So I don’t remember what we did.

In the book it’s standing on a box with a sort of a penguin skin on it and one of your colleagues, a dog with his paw dipped in seal’s blood and then put into the hand of… I was wondering whether these actions had a sort of… presumably this is what the ship always did when it crossed this line with people who hadn’t been across before. I just wondered whether there was any significance of those particular acts?

No, dreamed up by a member of the crew. There may be traditions that I was not aware of.

Yes.
But having Neptune and doing something uncomfortable for the new people, bullying them in other words, that’s normal and so yes, now you say that I do remember, it must be in my diary or in John Giaever’s book, but otherwise I don’t because I haven’t got any photographs of it.

[end of track 4]
Could I start today by asking you to go back just a little bit and to think about Bryanston and Oxford and the navy training and to ask you, as it is a life story interview, about any significant friendships and relationships over that period?

I kept in touch with one or two school friends and one is dead and the other I still exchange Christmas cards with and this is sixty some years ago that we were together in school. And I joined the navy [coughs] as a volunteer at the age of seventeen because I had seen the war from my home in Maidstone, Kent with all the German bombers going over and the Battle of Britain in the air and wanted to get my hands on the Germans. This was a very common emotion at the time. And I would have preferred to have become a pilot in the RAF, which probably would have cost me my life, but they wouldn’t take people as young as I was, but the navy would, so I joined the navy. And they had a scheme called the Y Scheme that marked you out as possibly officer material from the start, and I was in the Y Scheme. But we went through all the ordinary training of sailors on the lower deck and… before moving up to a sort of higher standard of training.

I realise that at Bryanston and, you know, training in the navy your opportunity for meeting girls would have been limited, but I was wondering whether you had the opportunity for any relationships of that sort of…

No, and I think that’s one of the great disadvantages of a single sex school and Bryanston has gone co-ed now some years ago and I think it’s much better for social development. I mean girls were something quite outside my experience when eventually I got to meet them after school, so I’m not in favour of an all boys school.

And at Oxford, I wonder whether you had any relation…

Oxford, I had one or two girlfriends and one quite serious one, but since I – well it was getting serious in my third year – but since I was planning to go to the Antarctic we knew it would be silly to get engaged because things change at that time of life a lot and that was
highly advisable because she was married by the time I got home from two and a half years.
[laughs] And otherwise very slow because of the difficulty of being in one place and moving
from one country to another; moving to Canada and back here, then moving to the States, so
that a large part of eventually settling for that one on the mantelpiece was a stable period
when we could meet each other a number of times and correspond a lot, otherwise there was
just too much going on in my life and I was not that anxious because moving from one
country to another with a family gets more unwieldy, and so I was not in a hurry to get
married.

[0:04:24]

Can you remember in your third year at university, when you say the relationship was getting
more serious, can you remember discussing the decision to go to Antarctica?

Yes I can. It was simply a decision that I made, I certainly was considering only career at
that stage and so I just said I’m going and we said, well we’ll meet when I come back, but we
didn’t. And this is a frequent experience of people going to the Antarctic for two years, so
that was nothing unusual.

Did she attempt to persuade you to stay or…

No. No, I think she saw that I was strong-minded and I was going to do it anyway.

Could you pull that light a bit closer to yourself and aim the shade – you can lift the whole
thing towards you so you get plenty light and then it’s not so much in my eyes. That’s fine.

[0:05:35]

When you were on the Norwegian-British-Swedish Expedition I know that the opportunity for
correspondence was limited. You could have a hundred words per month on the radio…

Each way, but sent by the radio operator in Morse code, so there was no speaking involved.

Could I ask who you corresponded with while you were away?
My mother. And curiously enough, as I found later when I was married and with the Russians, in fact every expedition we find afterwards that we underplayed any problem with the object of not worrying the person at the other end, so that I played down the dangers that I was experiencing in the field and one’s girlfriend or wife played down problems with home and children. And this is universal and we had lots of laughs about it because you discover afterwards that your wife has been desperately ill and you’ve fallen down a couple of crevasses – I never did actually – and it’s only when you meet up again that you become honest.

_Did you correspond with your father?_

[coughs] No, he was not a corresponding type and was so far removed from the life of somebody on a polar expedition, because his interest was in the classics and in his last few years he was contributing to a Medieval Latin dictionary which meant long hours with his reading of Latin and Greek, and Latin in that case, and a card catalogue. So he and I did not correspond but it was not that I… I respected him a great deal but we had nothing in common.

_Did you want to correspond with him, would you have liked to have done?_

No, I don’t think so, I don’t think it crossed my mind, it probably didn’t cross his.

[0:08:12]

_And can you remember what you did discuss with your mother, notwithstanding the fact that you were hiding anything that you thought might worry her?_

The temperatures, what we were doing, whether we travelled, what we were eating. Very bland things. In fact it was quite difficult to think of a hundred words in a month that was worth sending. We all found that, specially during the first winter, we were just getting on with our job so we felt we had to fill the hundred words and weather was one thing and what we were eating was another, but nothing very significant.

_Can you remember what she told you about her life at home, what she was up to?_
Again, very bland things. She had a… they’d moved from Maidstone to a neighbour village, Bearsted, and had a four acre smallholding and my father continued on with his dictionary and she ran the four acres, and so she told me about what animals she had and how, what changes, and pigs and goats and horses and occasionally cattle. So very uninteresting and bland subjects.

[0:09:58]

And when you said they had moved to this other place, is that your mother and your…

And my father while I was in the Antarctic, they moved.

Did your father come back from Burma while you were on that first…

No, he came back in 1942 when I was still very much in school. He worked in the India Office during the war [coughs] and his… he couldn’t tell me about his work and he used to go up to London on the train and come back in the evening and I said, ‘What did you do?’ and he said, ‘I read the papers on my desk and then I came home’.

But he wouldn’t tell you what the papers contained or…

No, and I discovered why afterwards. Many years he said that he was sitting round the table with Lord Mountbatten deciding on the reinvasion of Burma and it was because he knew the geography so well that he was on a committee talking about this.

[0:11:09]

Can you remember how your parents interacted at home?

At peace, but remote in that one by that time was a farmer and the other was a classical scholar, and so they didn’t have much to talk about. But they lived together and got on with their lives. I never found them fighting or anything. So it was just a relationship of mutual tolerance of two people with very different interests.
Did they ever go out together in the evening, did you...

No. No, in those days very few people did go out to have a meal out, that came later.

[0:12:04]

And on the expedition, the Norwegian-British-Swedish Expedition, when occasionally a plane might bring letters or the boat would come back and bring letters, what were you looking forward to receiving?

Just news from home and we didn’t have any intercontinental planes at the time so planes didn’t bring anything, it was just the ship that came once a year. And I boasted when I got back that if an invoice had arrived at my home the day after I left in November 1949, I would not have been able to open it and pay it until March 1952, because I wouldn’t be in a position to write back.

Thank you. And who did you miss most when you were away?

I don’t think that came into it because we were so involved with what we were doing. We were all very keen and in fact it would be impossible to live with somebody in the Antarctic if they weren’t roughly equally as keen on getting on with the job, so we really didn’t think of anything else. I would say we didn’t listen to the news on the radio more than perhaps once a month and the Korean War was going on at the time and the only thought we had was how stupid that people are fighting and killing each other at the other end of the world when there’s so much to be gained by peace.

[0:14:07]

Could you tell me what would make the ideal expedition companion?

Interesting question. A wide range, I’ve concluded. Anything from the life and soul of the party to a loner. And the sole criterion which makes you acceptable to other people is that you do your job well and I have been with people who are party people and love talking and
drinking and I have been with loners and I get on with them all. I think we all do. We may tease the loners, but we respect them if they do their job.

Which were you? A party person or a loner?

Halfway between.

Okay, thank you. In terms of actually sharing a sort of small tent with someone else, what would you hope the person that you were sharing with, what would you hope that they were like on an expedition? Did you have a preferred type, if you like?

Well I had one that I spent many months with, he was Norwegian and he was employed as a dog driver but he’d been in the war in Spitsbergen and had some pretty hair-raising experiences; being chased by Germans and being shot up. But the main thing was he accepted his job, which was to come as my field assistant. We got on extremely well. He could read my English language books when he’d finished his Norwegian books and when we mixed with the Swedes he could read the Swedish language books. He was an avid reader, whereas I had the notes to write up and diary to write up – he didn’t keep a diary – and we really didn’t have a hard word in two years because he was such an easy going chap and did his job.

Which member was it?

Peter Melleby.

[0:16:33]

Were there people on the expedition that you would have preferred not to have shared a tent with or spent a lot of time with?

Yes, there were. I think my boss, Valter Schytt, we had a good straightforward professional relationship; he was in command and I was number two, but he had been somewhat spoiled as an only child and so liked to have his own way and was… found silence difficult, whereas I and Peter Melleby never found silence – there were no implications in silence of not liking
one another - we’re just quiet people and spoke when necessary. And the other was the
doctor who was very, very gregarious and couldn’t stop talking and so I wouldn’t have much
chance of writing up notes while he was talking. But otherwise, otherwise I can’t think of
anybody who would be difficult to live with in a tent.

_How was Valter’s sort of spoiltness manifest?_

In getting his own way, having his own way, expecting that I would accede to everything he
wanted to do, in the way that spoiled people do anywhere actually, they expect, they’re used
to getting their own way because their mothers would have let them have their own way.

_Do you remember a time when you in that case had to say no to something that he expected
you to do?_

I think once or twice I did, but I cannot now remember the circumstances. This is many
decades ago and of course it would have been very serious situation if I said no and I just
can’t remember why, but he lost his temper with me a few times and I expect that was
because I wasn’t doing what he wanted.

_You don’t remember exactly why he did, this far on, why he lost his temper?_

No I don’t remember why he lost his temper, but there are times when you both become a bit
frayed if you’re tired and working long hours and this is absolutely normal. But we both
accepted that we were there to do a job and I accepted my position and we, certainly I, we
would have been very ashamed of ourselves if we had allowed any friction to affect the work
so that there were times when Valter had been angry with me and we were not on speaking
terms, but we got on with the work because we would have felt very bad ourselves if we had
allowed personal relations to affect the work. We all knew what a privilege it was to be
there, that our job was to do what we came to do and that personal conflicts would be a very
poor excuse for not performing well.

[0:20:38]
At one point there was a, according to your book, a discussion of the ideal woman among the party. Do you remember what you said?

I don’t remember what I said but I had very firm ideas, which impressed people and I think I still have a dedication in the front of the book *Lorna Doone* which I was given on my birthday and it says that I was definer of the ideal woman. But I can’t remember what the ideal woman was because this is a very long time ago, but I was thought to be very particular, very fussy about my ideal woman and of course the four married ones had no choice, they were already married and those of us who were bachelors were still able to talk about the ideal woman. [laughs]

Do you remember what others said?

I think they said, to me, you haven’t a hope of finding this one. [laughs]

You were particular, were you particular about looks or personality or both?

Ability to live with somebody for many years and to produce a family and not fight, so mutual self-respect is surely the most important thing in a marriage.

[0:22:33]

Thank you. Could you tell me about Ove’s physiological research on this expedition – I may not be saying that name correctly.

Pronounced Oova – O-V-E. It was interesting because he was sent there, he was there as medical officer, but a medical officer with fourteen healthy men has nothing to do, so that it was very sensible to try to do some research and what he did was take blood tests once a month from all of us [coughs] from our earlobe; he pierced the earlobe and got a few drops out into a pipette and spread them on a microscope slide and he was counting the red blood cells I think. And this he did very assiduously and carefully. And also oxygen consumption. The period when you’re normally… your metabolic rate is lowest is something like five o’clock in the morning after you’ve digested your supper, you’re sleeping peacefully. And so he woke us up at five or six in the morning, we weren’t allowed any food before he put a
mouthpiece, like divers, in our mouth and clamped our nose and we breathed through a machine which had a float in it with a certain amount of oxygen in it. And so he was measuring the rate at which we burned the oxygen in this air. We were breathing normally. And this was based on metabolic rate. And he published a number of papers afterwards on his investigations and in fact he got a Swedish doctorate which is more difficult than a PhD in this country, it requires a good bit of published work. And so he thought he was good at observing how we got on with each other, but in fact he was the most sensitive person around and far too sensitive about human relations and the sort of brushes that we had every day with colleagues that didn’t mean anything because you got over them in no time, he noted and I remember him having a pep talk saying that of course I, the doctor, am specially trained in observing things like this and I wanted to say, but didn’t, that you’re far too sensitive about things which the rest of us regard as trivial.

Did it sort of then drift into almost psychological research?

Yes. He was interested in that, but I don’t remember that he published any papers on it. He probably realised that none of us went off our heads and were pretty level-headed people, so there was nothing to write about. What he wrote about was the physiology that he’d worked on, general health, and then took a very special interest in the mites that we discovered on a mountain inland and he cultivated those and took them home and they were found to be a new genus, a new species, and they’re named after him [Maudheimia wilsoni].

Did he talk about his interest in psychology in detail?

Not in detail, no. Because it wouldn’t have fallen on fertile ground. We were too busy with practicalities of living together.

[0:27:01]

Could you comment on the extent to which you think the expedition, at least for some of the members, was in part a way of prolonging certain kinds of positive wartime experiences? So it involves travel and risks and explosives and big machines and logistics. I wonder whether, well (a) is there anything in that and (b) whether actually it’s something you discussed yourselves at the time?
I think we neither thought of it nor discussed it, but there may be an element of truth in what you’re alluding to, but I’ve never thought about it. I mean I was adventurous from long before I went to the Antarctic, long before I joined the navy, and so would have gone the same way regardless I think. Possibly the other ex-service people had got used to the taste of adventure and wanted some more.

[0:28:20]

Thank you. I wondered whether you could comment on the effect of the landscape of Antarctica on you at a kind of emotional level, how did you feel about the landscape?

I loved it. I loved the fact that it was neither for you nor against you. I think emotional writers who visit the Antarctic say what a ghastly miserable place and how terribly dangerous, but when you learn about crevasses and how to avoid them, there’s nothing that is against you. The land is totally neutral. There was Freddie Spencer Chapman in the war in Burma wrote a book called The Jungle is Neutral. Well, the jungle is full of snakes and all sorts of nasty things, but it’s actually neutral and it’s your reaction to the jungle or the wilderness that has anything in it. So I never felt the landscape was against me and I was quite happy to live in a tent alone, which I very seldom did, but if I’d been hundreds of miles from anybody else alone in a tent it wouldn’t have bothered me because we were confident, self-sufficient and knew how to handle ourselves and had planned for whatever eventualities we could plan for. But journalists inevitably on a short visit to the Antarctic seem to say what a hellish place it is and there’s dangers lurking at every corner. Well, once you learn the dangers they are substantially less than crossing the street in Cambridge where you can easily get knocked down and killed. Our risks were substantially less than you have at home.

And what about the sort of visual sort of spectacle of the landscape – how did you feel about that?

Very, very moving. Beautiful mountains. I think the most beautiful thing about them was that you said to yourself nobody has seen these, nobody else has seen these since the world began, and that has always moved me greatly. The mountains couldn’t care less whether you were looking at them or not, but on a human emotional point of view, to realise that there’s
this magnificent landscape that has been there for hundreds of millions of years, sitting pristine in its whiteness with no interaction with humans, because no humans had ever been there. This crossed my mind many, many times and I was very proud of having the privilege of being the first to see them.

So it’s partly the fact that this landscape is sort of un-peopled and empty?

Yes.

Okay. And can you remember how you were thinking about normal life, you know, thinking about life at home while out here in Antarctica? What was your view of the sort of alternative to this kind of life, being on an expedition, being a scientist, how did you view the alternative sort of ordinary life at home?

Well I was very, very glad not to be a part of the ordinary life at home because the ordinary life at home involved for most people doing what my mother had advised me not to do, that is not to get stuck in an office like my father. And so I thought I was the most privileged, we were the most privileged people in the world and this of course contrasted with what the people in the rest of the world thought about us, that we were having a miserable time out of touch with the world. Our views were totally opposite. We felt enormously privileged to be doing what we wanted and seeing this magnificent landscape.

Can you remember specifically what you were glad to be avoiding, in particular what you imagined you might be doing if you weren’t here, that you didn’t want to be doing?

I think above all not working in an office and having regular hours. We were all so keen on the work that we had no difficulty getting up in the morning. The only person that had any difficulty was the doctor. He was a night owl; he went on late into the night, which is rather annoying for the people living in the same hut as he was because he wouldn’t go to bed. But I think the rest of us kept normal working hours and we worked from breakfast to suppertime with perhaps half an hour break for lunch and then after supper in the evening was considered free to write up notes, write up diaries and read books.
Given then that you settled into fairly regular working hours, what would have been so dreadful about office work do you think?

Probably that you would be deciding fewer things for yourself. I mean although I was under the command of Valter Schytt, the actual decisions about how and what to do every day were taken by each of us and obvious things like taking turns in the cold lab looking at crystals under the microscope, that was obvious that we would take turns and as soon as we began to freeze we would go and have a cup of coffee. But otherwise much of the work was alone. My surveying of the ice movement stakes within three kilometres in every direction, after we’d measured the initial baselines, I was doing the triangulation with a theodolite utterly alone during the winter when it’s black dark. And I was solely responsible for that and realised that it was important to do it accurately and did it extremely accurately. And it was tough in that it was very cold, but I was dressed in reindeer skins and all the clothing I could muster. And there were difficulties about looking through the theodolite because the eyepiece iced up from the warm moist air coming out of your eye and the other end iced up through breath, both ends breath condensing on to the lenses and so you had to frequently clean the lens and then stamp around to try and keep warm and then observe the theodolite very, very delicately because it’s extremely delicate instrument. You’re trying to measure to an accuracy of one second of arc, which means you virtually mustn’t touch it and if you touch it you must not be pushing it one way or the other.

Did you prefer that kind of work, that model of working, working alone in the environment?

I’ve always been very happy working alone and have been very self-disciplined and perhaps that came partly from the navy. At the age of nineteen I was navigating officer of a minesweeper and was trusted to be the only person on the bridge while everybody else except the engineers slept in potentially hazardous waters by navigating, and had the lives of thirty-nine people in my sole hands, everybody else being below decks. And I felt very proud and happy of having that responsibility in the navy and knew that, well could easily
envisage the consequences of falling down on the job. And so the self-discipline that I learned in the navy has been of value my whole life a great deal, and in that Iceland expedition I’ve just realised how well disciplined, self-disciplined I was in terms of the preparations for a job that we’d agreed to do but wouldn’t be worth doing if you didn’t prepare for it carefully.

Apart from your skills in surveying which you learnt, started to learn at Bryanston and then at Oxford, geography, and you’ve mentioned the Hints to Travellers RGS book, apart from those skills, I wonder whether you could reflect on what being trained as a geographer meant for what you did on the expedition. So were you doing things on the expedition that were because you were a geographer do you think? Were you encountering the landscape in a particular way because you were a geographer, were you writing certain things down because you were a geographer? So apart from the surveying which I know has that geographical training behind it, anything else you were doing that you think is because you had geographical training?

A natural interest in geomorphology. In other words why were the mountains the shape they were, what was the action of ice on them, glacier erosion and things being moved from one place to another, but above all the sculpting of the landscape by ice. Yes, I think from the first year in Oxford I enjoyed geomorphology very much and here was un-analysed geomorphology in a big way in the Antarctic and you could speculate about how things had formed. There was nothing new about it. If you had looked at the sculpting of the mountains in Scotland, that was a very good grounding for analysing the landscape in the Antarctic.

Had you looked at the mountains in Scotland as part of the Oxford geography?

No, I think only from books. Only from… textbooks and papers analysing the origin of the landscape in Scotland, but it was all very familiar. You looked at a mountain and immediately said ah, I see how here we got u-shaped valleys and here we got flat plateau tops because they’re protected by a little bit of ice and no erosion is going on in them and the ice streams are the, the big glaciers are the equivalent of rivers, they’re obviously carrying a lot
of rock into the sea. But in the Antarctic, uniquely, is all under the ice, so you know it’s there but you can’t see it.

[0:41:54]

Did you take photographs on the expedition personally as a sort of, as separate from the scientific…

Many. I’ve got a photograph album, three photograph albums I can show you if you want to look at those. Yes, we all did. I think because we all realised what a unique privilege it was to be there and it was our duty to record what we saw. So we all took photographs.

Do you think that therefore in the sense that you were recording, did you take photographs in a particular way that would distinguish you from someone, you know, a traveller taking photographs of an unusual place? Was there anything systematic about it, did you try and get particular views on things?

I don’t remember doing that. We certainly recorded what people did. I went around systematically taking photographs of what the other expedition members did, what their work involved, and Valter Schytt was a very good photographer and he did the same thing, rather better than I did. But he was second in command of the expedition and John Giaever, the chap in command, didn’t even have a camera as far as I remember, so that Valter had a duty to the whole organisation to make a record of what we were doing and what we did. And he would have been very capable, if John Giaever had died, of writing the expedition book afterwards, the official account. So that we were photographing everything we could: people and things and landscape.

[0:43:59]

Thank you. Now when you left this first expedition, you came away from Antarctica, packed things up and one of the things that you would have packed up is the data which you’d collected on the expedition. Could you tell me what that data looked like physically? What had you written down and how? So when you came away from Antarctica and you had a pile of papers or… what did the data look like, what were you then working on?
A pile of notebooks, because my surveying, which is not only at Maudheim on the ice shelf, but measuring ice movement inland was a matter of simple trigonometry recorded in small notebooks and then copied out afterwards. It’s a very important tradition on polar expeditions – you see I’d read a lot about polar expeditions – is to bring back records. So the normal thing is to have a notebook while you were actually observing that you wrote in and then in the tent in the evening you would make a fair copy of that because the original notebook would have a lot of shorthand – I don’t mean technically shorthand, but your own short abbreviations for things – and the important thing in writing up in the evening was to write it in such a way that if you’d fallen down a crevasse and been killed, somebody else could use. Simple as that.

_Could you give me an example of something that might appear in shorthand and then how you would convert it into the fair version?_

You’d convert it into the fair versions simply by saying well, I know about all this but what if somebody else looks at this, can they see what I’m doing and why.

_So would it become more wordy, words written in full…_

Yes, more clear. A less, fewer assumptions. Because I mean I didn’t… my assumptions were there in my field book and I knew what they were, I didn’t need to write them down until I had to think of other people interpreting the data and I think this is very important always to consider what might happen if you didn’t come home because expeditions are extremely expensive, it was a privilege to be there and it would have been a terrible waste if you had fallen down a crevasse with all your data. But my fair copy would have always been in the tent and found. There was a Russian expedition in fact, Soviet Antarctic expedition many years later that arrived back at their ship over fast ice during a blizzard and all got on the ship and had a party and good night’s sleep and when they came out in the morning their tractors with all their year’s data had drifted away. So it was a whole year’s work of about fourteen men, was lost. And that wouldn’t happen to me because I would have always gone on board with my notebooks in that situation, not just myself. And well, I may be being wise after the event because I knew it happened, but there had been a number of times in the Antarctic that ice has gone out when you don’t expect it to go out and in fact sometimes with
people on it, including on the Heroic Age expeditions. It looks all very solid until it drifts out to sea and you are left on an ice floe with nothing.

So the fair copy was both something that could be interpreted by an outsider and a second copy as a kind of insurance on the data itself?

Yeah.

[0:48:41]

Okay. Thank you. So you came away from the expedition in that case with the rough field notebooks and with your fair copies of those. So perhaps we ought to start then with your actual working environment when you came back. Where did you work?

I gravitated to the Scott Polar Research Institute as a natural place to go, where you had other people interested in the polar regions, but I was working all by myself and I don’t remember at what stage Valter Schytt realised that if he was going to write up all the results it would take him ten years and that’s ten years out of his life and one has a career and you can’t just live on the results of a two-year expedition for ten years. And that was because together we’d achieved so much that it was obvious to him and that gave me a good start in my career because he said well, I’m better at doing this bit than you are and you are happy and you did most of the fieldwork for this bit, why don’t you write up that and I’ll write up this, and we divided everything we’d done, approximately half, totally amicably because it was clear who was either most interested or most involved in particular bits of it to write up. And then we handed each other all the data that the other was needing to write up. That was totally amicable and easy. And then he said why don’t you come to Stockholm because obviously we do need to confer, and since I was single I went to Stockholm and worked in Stockholm University for a whole year and had a very happy time. There were three of us working in the same room. There was me and Valter Schytt and Gösta Liljequist, the, one of the two meteorologists, Swedish meteorologists, who became a very distinguished professional and wrote a textbook of meteorology and a textbook of the history of Swedish participation in polar expeditions afterwards, both of which I have. So it was a very happy working environment. I don’t remember any conflicts at all. Valter and his family were very kind to me and it was really a very enjoyable year.
Where did you stay?

I took a room in an apartment block only a hundred yards from where we worked.

Did you make any sort of friends in the block or the university?

No, my contacts in the university were people who had worked with Valter Schytt before going to the Antarctic, people who’d worked in his research station in Lapland which I had been twice to before going south; once in winter and once in summer, and so I’d met a number of PhD students and I was still good friends with those. But… and that was adequate because we kept on working about as intensely as we did in the Antarctic because we were so anxious to cash in on this work in terms of our research degree, although I didn’t know when I was in Sweden whether I could or would get a research degree out of it. We just wanted to get published, that was what we were aiming for. And so we were working very hard, but we did have holidays. Valter and I had holidays together. He got his first motorcar, a Volkswagen, because in those days it was quite something to have a motorcar, so we made a number of trips together and as I say, his family was kind to me. But then the grant of money I had from the Royal Geographical Society was hardly enough to live on and so I taught English to businessmen in the evenings at a night school to try and earn some money and that was fun. So I was very happy there, got my first girlfriend there. I would have been - well the first girlfriend after the one before I’d gone to the Antarctic - and I would have been very happy to stay in Sweden but I realised that an international transplant like that would always leave you at a disadvantage compared with the natives and so I didn’t pursue that and came back and went to a don in Oxford.

I went to the Geography Department and said I think I have enough material here for a D.Phil, Oxford D.Phil. And they looked at it and had me describe it and they said well this is really not geography, it’s closer to geology, why don’t you toddle along to the Geology Department and ask their advice. So I did exactly that and found a very sympathetic geologist, Kenneth Sandford, who’d been on the faculty there for a long time and had been to the Arctic and therefore had some sympathy with what I had done. And I showed him samples of my writing up which I had done while in Sweden and he said, well this is good material, you certainly should be doing your research degree here. And he worked on the
authorities because the normal arrangement is that you register to do a research degree before you start your research, whereas I was two and a half, three years into my research and had no idea when I went before I went that I was going to do research that could be used in a research degree. And so he worked on the university to overcome the rules and make an exception and it was only then when I got to Oxford after my year in Sweden that I started paying university fees, as you have to. And so he supervised and every time I had a chapter of my work ready I would take it along to him and he would say if there was things he didn’t understand or if my terminology was not conventional or something, and he was always helpful. And then I showed each chapter of the report I was writing to as many colleagues as possible, because I never felt that I was uniquely competent in the field. I was certainly uniquely competent in what I’d done, but in terms of analysing it I was under-educated, so that my analysis was not as full as it would have been if I’d had for example a degree in physics, degree in maths and degree in geology. But you can’t practically do all of them, so I hadn’t. So as I mentioned before, I was under-qualified. But what came out of it was a D.Phil thesis that passed without difficulty.

[0:58:01]

What did you want to be able to do in terms of analysis that you felt you would have needed physics, chemistry or geology in order to do?

The deformation of the ice shelf. I produced the results but was incapable of analysing them in terms of the physics of ice and people were very polite about that but it was obvious that it should be taken further, but nobody else had the time to take it further. But later, some years later, probably ten years later, a German came across my data and realised there was very good data and should be analysed and he submitted it in Germany in German as part of his German Ph.D and I was very happy about that, I gave him all the help I could. So it was done in the end. The ice movement measurements inland where we were measuring movement relative to a mountain relative to fixed points was very straightforward elementary trigonometry and that I could do and that I did analyse and I published in… in fact, we weren’t doing anything except reporting the rate of movement because there wasn’t… that itself was enormously interesting because it was from almost nothing in a year to many metres in a year. But it was exploratory measurement of the rate of ice movement.
Everything was exploratory because there was no precedent, nobody had done it before. People had no idea. So it was the obvious thing to do in our exploring the mountains.

[1:00:10]

_I’m interested that you went to the School of Geography where you’d done your degree, took your results and they thought that it wasn’t geographical, because you said that you’d enjoyed and been taught geomorphology. Do you remember who taught geomorphology at the School of Geology?_

No.

_But it was a component of that degree?_

It was a component and I remember enjoying it, but being sixty years ago I can’t remember the name of the person who taught it.

_I wonder then on what basis they sort of rejected your work as being not geography and more like geology if, as you say, you regarded yourself as a kind of geomorphologist._

Well, the thing about Oxford geography was that it was predominantly human geography, the faculty was human geography, and it was Cambridge that was much better at physical geography because of Frank Debenham being a geologist at the time when there were no geography… teaching. So that was well known that Oxford was far more human geography and so it was no great surprise and I couldn’t come to Cambridge because I was a stranger and didn’t have an ally on the faculty who had judged my work as being worthy of a research degree.

[1:01:53]

_Thank you. To go back to the data, and if we could first of all go back to the translating of the draft field data to the fresh copy, did you ever find, sitting in your tent in the evening, that you looked at your field notes wanting to convert them into the fair copy and you were not_
able to understand them because of the way that you’d recorded them or something was unclear and that you wished that you could go back to check?

No I don’t think I did because we were writing up within twenty-four hours of observing. I think that certainly would have applied if I had left it till a couple of years later when I got home, there would have been things that I’d forgotten exactly the circumstances. That is the value of a fair copy.

Thank you. And you’ve said that you worked in an office at the university in Sweden with Valter Schytt and others in the office. Could you tell me about a typical day of actually writing up your data? Now were you using the fair copy notebooks, were you working from those?

Mm, yeah.

Any other materials?

Well, not everything got into notebooks, some observations were on separate sheets of paper and some required drawings, drawing graphs and that you did on the basis of the data that you had in the notebooks. And then there were no maps so we had to draw up our own maps from material that we’d collected, partly surveyed, partly sketched, to show where we did what we did. It was all very straightforward and I knew what I was doing and what needed doing, so I was not at a loss, I simply did everything that I felt capable of doing and again, showed my drafts to as many people as possible, and always have done, including my books, I’ve had people read them before I submitted the manuscript because I’m not too proud to have help from anybody improving a manuscript, improving a paper.

Were these sketch maps also in your field notebooks?

No, they were compiled later because we used aerial photographs which were taken independently of the wintering people because they were taken the second summer and the third summer by the Norwegian commercial company who brought two aircraft, and then the Swedish Air Force in the third summer. So these I didn’t get hold of till I got back and they went to the Norwegian Polar Institute in Oslo so I had to go there to get them, but then they
made me prints of these nine by nine aerial photographs for nothing because I was employed on the expedition and they were the lead agency in Norway and so we were all pulling together.

So you went there and they gave you those copies and then you took them back to the office in Sweden to help you to compile the sketch maps along with data, okay. Now, I know that you’d produced these fair copies but sitting at your desk in Sweden with the notebooks, with photographs, with other sheets of paper that you mentioned, did you ever wish at any point that you could pop back and just check something that you were reading as data?

Probably, but I can’t remember.

Thank you. And what did the final write up look like in comparison to the field notebooks, which I imagine would be organised by day would they? So data by day or…

No, it sometimes took several days’ work to complete a bit of work in a given place and so the date was pretty unimportant. The date comes into my narratives because I think that’s important, but in… when you did a survey is all relative to the first time you observed an angle and the last time you observed an angle, so the dates don’t matter much.

And in writing up from notebooks to the final report, what did you do to make that conversion?

Well, I wrote it in a narrative saying what was the purpose of the experiment, how we did the observations and what the results were. I think that would be, that would apply to almost any kind of research.

[1:07:51]

Thank you. Now you said that you would be keen to stay in Sweden but felt that if you did you’d be at a disadvantage. In what sense did you mean that disadvantage?

That you’re brought up in a different culture and a lot of cultural assumptions that go with any career in any country and there are some conventions that are very easy for people, that
is across the Atlantic, because they’re English speaking and have the same cultural origins, and so when I later went to the States I felt completely at home there and working in Canada, completely at home. But it is, Sweden is more of a – was at the time – more of a Germanic culture. In fact the Swedes had up until the Second World War written and published their scientific data in German in German journals, so they all knew German, but during the war, at sometime during the war they realised that they were on the losing side and all brushed up their English, and their English was very good by the time they were with us. And…

[1:09:22]

*And could you tell me anything you can remember about your second girlfriend, the girlfriend that you met in Sweden, the sorts of things you did together?*

She seduced me, which was very nice, and I think it’s quite, more common than you’d think, that men think they always take the initiative but it’s not [laughing] always so. But no, simply that we had great fun together.

*Where did you meet? Where did she seduce you?*

Valter Schytt, one of Valter Schytt’s friends.

*And can you remember where you met and when and…*

No.

*And at the end of your time in Sweden, was it a case then of another conversation with you saying I’m moving, or had the relationship ended before you left or…*

No, it hadn’t ended, but it was cold-blooded decision on my part that I would not pursue this and I wasn’t looking for a wife at that stage. It would have been too much of a difficulty in terms of earning enough money to support a wife. I mean PhD students are impecunious and you struggle along on whatever you can scrape up, but you couldn’t look after a family. I mean there are people who do, but with great difficulty and also to the detriment of their career in that they may get pregnant when they are still trying to do their research degree and
other complications of looking after a wife and child on virtually no money when you’re supposed to be concentrating twenty-four hours a day on your thesis, I could see that was not for me.

[1:11:59]

*Just before we move on, could I ask you, when you first came back from the Norwegian-British-Swedish Expedition, where did you go to live, I mean when you came back?*

Initially I came to Cambridge and lived in digs just like an undergraduate might have. I remember two: one in Eltisley Avenue and one in Madingley Road, each of those was just a room and so I didn’t entertain in it or anything. My social life was outside, but all based on the Scott Polar Institute.

*So you didn’t return to the family home?*

Only for days, because there was nothing to do there except… well no, enough to exchange thoughts about the last two years with my parents.

[1:13:24]

*Could you talk about that, about what you said and what your parents said about it?*

No, they weren’t interested.

*They weren’t interested in…*

What I’d done. Because it was so far from anything in their experience.

*That didn’t make them interested in it then, the fact that it was different from their own experiences?*

No, I don’t think it did because they were both busy on their own lives and I think they were generally pleased that I was doing something that I wanted to do, but I don’t think they were
interested and they were both dead by the time I wrote my book about the expedition. So I mean relationship was perfectly happy with my parents, but just we had very little in common at that stage.

So you, I mean you went home for the first time after being away for two and a half years in Antarctica, which is not a sort of ordinary sort of thing to do, and they weren’t asking you for stories or they weren’t wanting to...

No, they weren’t, they really weren’t interested because their lives were so far removed from mine and mine was so far removed from them. So when I’d seen what animals my mother had and what stables she’d been building for the horses, that’s it, I’d seen it and I certainly didn’t want to discuss a Medieval Latin dictionary with my father. So we were entirely friendly as a family, but by that time my interests had so far diverged from theirs, or theirs had diverged from mine, both.

Did you try to tell them about it and then sense that they weren’t interested?

Yes.

So you started to talk about it and how did you realise or sense that they weren’t?

Oh, the same you’d realise anybody else is bored; drooping eyes, eyes wandering, no more questions to ask. Very simple.

[1:16:12]

And your mother would have been working outside a lot – is that right? Where was your father in that house, which is a new house isn’t it?

It was a bungalow in the country and he had his own bedroom which was his office and he only came out for meals, and I mentioned had very little to talk about with my mother, but by that time they’d been married half a century and as one does, you get into a relationship where not much transpires between you. Luckily that never happened to me, we always had something to talk about. But it was perfectly satisfactory and I would have thought perfectly
normal relationship that a man and wife get absorbed in their routine and don’t have much to talk about.

_Do you remember specifically attempting to tell your dad about what you’d been doing and his reaction?_

Yes, that fell totally flat, it didn’t move him at all so that never got going.

_Do you remember the sort of the scene, I mean were you standing in his study telling him or can you remember where this conversation took…_

Probably at mealtimes when we were together, but no response, so it didn’t gain anything to talk about it.

_How did you feel about that, about that lack of response?_

Well I think children, and with your own children you hope that they will grow to be their own people and have different interests, so I wasn’t at all surprised about that, any more than I’ve been surprised about my own children growing their own interests, it’s just what happens.

_But I wonder how you felt about the fact that your dad wasn’t interested in it, given that you might have expected him to be, given what you’d done, it wasn’t as if you were…_

No I don’t think I did expect him to be because his life had been so totally different from mine. He might have struggled to [coughs], might have struggled to try to show an interest, but it would have been a struggle because he didn’t know anything about what I’d been doing and was not asking questions because it was so far divorced from anything he’d ever done.

_Was there anything positive about that for you that you were doing something that was very different from your parents’ lives, that they didn’t know much about the…_
No I don’t think there was anything positive about it, I regarded it as a normal result of growing up, that your children drift away into their own interests and I think this is normal and it didn’t surprise me.

[1:19:51]

Was your sister around at that time?

My sister by that time when I came back from the Antarctic she was married and having children and never very close, and so occasionally came over, occasionally we all met at my parents’ house for a meal or for Christmas sometimes and that was all very pleasant, but again, she was a medic and her husband was a schoolteacher and we behaved as a very normal friendly family, but beyond that I don’t think we had any closer relationships.

Was your sister interested in what you’d done when you told her about it?

I certainly told her but she was a GP practising in schools and that is very far removed from what I was doing, so we didn’t have anything to talk about in that. But again, this didn’t surprise me because I think it’s normal.

And when you were speaking about your childhood you mentioned that you felt jealous of your sister because of a close relationship with your mother, did you still have these feelings at this stage?

No, because by that time I was an established professional and had no need to feel humbled by the fact that my sister was believed to be cleverer than I was, so that didn’t worry me at all, I was my own man by then. So we were both thoroughly grown up and grown away from each other in a totally normal way.

And were your parents interested in what she was doing in her career or…

Not really, no, because she was in medicine and neither of them was and so they weren’t interested, no.
Thank you. Now, could you tell me how your next sort of major employment came about, which as far as I know is your work for the Defence Research Board in Canada. You'd been to Sweden, presumably you'd then come home and you said you'd gone to Cambridge?

No, I went to Oxford to, I suppose I was... I was either one or two years in Oxford, then got my degree and then gravitated to Cambridge because of the Polar Institute and polar people here and it was known by the then Director of the Institute, Colin Bertram who was a biologist and had been on the British Graham Land Expedition before the war, it was known that I had thoroughly enjoyed my polar life up to that time and was going to need to find a job. And so the Canadian government had been on a recruiting drive in England for people to work in the Canadian Arctic and here was I shortly to be unemployed and looking for a job in the Arctic or Antarctic and that is how we got together. So it was Colin Bertram’s good offices that got me the job. In fact I was working all the time for the Scott Polar on a contract with the Defence Research Board of Canada.

What year did this contract start?

1956 to ’59.

Why do you think that the Canadian Defence Research Board were looking where they were in Cambridge, SPRI, for people to do this work? Why not recruit from within Canada?

They were... Canadians never liked working in the Arctic; they regarded it as hardship and they would do it if they were paid a lot extra. I mean that is a very wild generalisation but it’s a true generalisation at the time and whereas the British were more adventurous, less wedded to a high standard of living that Canadians were at the time. The Hudson’s Bay Company for hundreds of years, who’d been largely populated by Scots, because the contrast between the miserable standard of living in Scotland and rugged standard of living in Arctic Canada was not as great and so there was a great tradition from John Rae onwards, who was a great explorer in Canada, involved with the fur trade, and they could not find enough people who wanted to work in the Arctic without being paid extra. And I didn’t want extra, I just wanted an average salary. So the Canadians were used to demanding hard lying
allowance for going to the Arctic and we weren’t. And if you’re going to work in the Arctic, above all, what’s needed is interest and diligence and not saying, well you’re not going to pay me more so I’ll only work eight hours a day, or something. I mean I think that’s a characteristic of the sort of people that peopled the Scott Polar Research Institute at the time and when I got to Canada in the Defence Research Board it turned out that all the people in my group, the Geophysics Directorate as it was called, were people of British origin.

Were they?

The head of the section, Frank Davies, had been with Byrd’s expedition in the Antarctic as, I think, a radio operator and Geoffrey Hattersley-Smith who was the geologist from Oxford who got me involved in the Exploration Club in Oxford, Moira Dunbar was a geographer from, I think she was Oxford, and Jim Croal was a Lieutenant Commander in the Canadian navy who was of British origin, and Trevor Harwood, geologist in charge of the bit that I worked for, his parents were British. And I don’t think this was coincidence, it’s just that we, none of us thought that pay, extra pay mattered. If you were doing the job you wanted to do, you needed to be paid because we all needed bread and butter, but you didn’t need to be considered for extra for working in the Arctic. And I think the same applied with the British Antarctic Survey, that until very recently the criterion of salary was what you could expect to get back home, not a penny more. And people were quite happy with that. I suspect now that people have got trade unionised. I never was. And in fact when I was working for Antarctic Survey, once the local union rep came along to me and tried to argue me into joining the union and I said well, why, I’m adequately paid, I have no complaints. And he became desperate because he thought everybody would want to get more pay, and so his tack was well, think of your successor after you leave, he will want more than you’re getting. I said well, that’s his problem. [laughs]

[1:29:53]

Could you tell me what the work involved, for the Canadian Defence Research Board?

Yes. It involved finding, digging out the literature of everybody who’d ever worked in the Northwest Passage, but specifically the period 1900 to 1958 because it was thought that conditions may have changed before that and the data was sparse before that, they were
sparse anyway, and the only reason for limiting my analysis to fifty-eight years was that it was enough to see if there were trends in the ice. It was enough data sampling of historical records and should form a good basis for drawing conclusions about the best time of the year to go to the Arctic. Context was that they were setting up this Distant Early Warning line of radar stations right across Arctic Canada - it was joint American and Canadian – and using a lot of un-ice strengthened ships and therefore terrified of ice damage and of getting frozen in at the end of the season, because these are ordinary people who had no interest in the Arctic, they were just sailors employed on earning a living, and as a result of this fear of getting frozen in late in the season, they were, I was able to conclude and convince them at the end of my four years that they were going between one and two months too early and should have been doing everything one or two months later, by which time the ice would have cleared and still there would be no danger of being frozen in. So that was the conclusion of four years’ work and it was what they wanted to hear and they told me that they saved millions of dollars on damage to ships after they’d read, they’d changed their timing according to my research, compared with before when they were suffering a lot of damage.

What was their period of operation before in terms of the months that they were running ships up there and what was their period of operation as recommended by you?

They were pushing up through ice in June and July, whereas I concluded that mid August to mid October would be much better.

[1:33:17]

What were the ships carrying?

They were carrying all the radar equipment for setting up a row of radar stations, all looking northwards, and all the equipment for the people manning them. In other words, huts to live in and vehicles and all that and in many of them, airstrips so that food supplies could be brought in most of the year, but not fuel because that was too heavy so you needed to get ships into all of them to bring the year’s fuel supply. And so a great many of them had small airstrips big enough for a Dakota to land and therefore they had all the equipment for making the airstrips; enormous bulldozer and so on. That’s what the ships were carrying.
Who owned the ships? Were they Canadian navy ships?

Canadian and American.

And what was this line of radar sites looking or listening for?

It was looking for either Russian bombers or later, ballistic missiles, but it’s probably too slow. It wouldn’t have been too slow for bomber attacks from the north and it would just give the North Americans time to launch fighter aircraft and get ready for battle. But this was the state of the Cold War at the time, that they felt that an attack from the north could be imminent and it would be silly to be caught by surprise.

How did you feel about using your scientific skills in the service of a military set-up like this?

It didn’t bother me because we were entirely defensive military set-up.

Would you have felt differently then if these weren’t listening stations, but were instead, I don’t know, sites from which rockets could be launched or offensive measures could be taken?

It would be a matter of the tension in the world at the time and I certainly saw no reason for the West to be taking the offensive at that time. Unfortunately some military men did, I mean there were Americans at time thought they should go after the Soviet Union and invade the Soviet Union. Thank God they had more, the top people had more sense. So I was affected by the Cold War propaganda as much as anybody, but certainly at no time did I dream that it would be sensible for us to try to take the initiative and try to knock out the Russians.

Could you tell me about the, how you thought about the Cold War then and the Soviet threat? You said you'd been affected as much as anyone else.
Well, we all read the newspapers and we knew that the Russians were difficult, that they were trying to sell communism all over the world and they believed that the world was going to become all communist because they believed that was the only fair way to live, that people should do their best in the service of their fellow men, which unfortunately was interpreted by the Russians as meaning what the state wanted. There’s nothing wrong with the principles of communism, I had a lot of thought about this of course because I lived a year and a half with them, it’s the practice that’s caused all the problem. But the worst thing of all is to believe that communism is inevitable because then it’s a short step to saying well, we’ll help a country convert itself to what is inevitable anyway, and that they were trying to do all over Africa and all over Eastern Europe and of course some of it by force. And all on the argument that it was inevitable anyway because it was the only fair system as they saw it.

[1:38:57]

Could you say a little more about your feelings about working on this particular project then in that context? You said that it didn’t bother you because it was a defensive system, could you say any more about how valuable you thought doing that particular project was as opposed to any other use of science. Could you say how you felt about why you were doing what you were doing?

I was doing what I was doing because I wanted a job in the polar regions and jobs in the polar regions are few and far between, it was as simple as that, I needed a job. But since I’d always been interested in the polar regions it didn’t feel at all strange to be taking up a job which required going there and understanding things, so it was quite straightforward that I needed a job and rather than going to the Labour Exchange I wanted a job in the polar regions and my contacts in the polar world were obvious people to help me find one.

Thank you. The results that you produced, were you asked to keep certain things secret or to be careful in any way about the science you created?

I was cleared to secret and shown some secret reports but they were very bland and I can’t remember anything exciting. I can remember that on one occasion since I was very friendly with my boss, he quite illegally showed me something top secret and I can’t remember what it
was because he thought it was so totally ridiculous to make it top secret that he wanted to share the contempt with me. And that was a schoolboy essay, much the same as the Iraq War was started on the basis of a PhD thesis we learned, it was probably a PhD or something, which said, drew attention to the fact that nuclear submarines can live under the ice for as long as you like and therefore North America could be attacked by, attacked by nuclear submarines launching missiles from the Arctic, the pack ice zone, and you wouldn’t need such long range to hit your targets in North America. And this, because it was a new idea at the time, had been marked top secret. To us it was bloody obvious that [laughing] you could go under the ice. But no, I had no… I was shown a few things marked secret but there was no earthly reason for most of them to be secret. But during the Cold War there was far more marked secret than needed to be.

[1:42:31]

*Were you asked to mark your own findings and work secret? Were you asked to keep the new knowledges about pack ice formations in the area you were looking at secret or to be…*

No.

*…careful about where you left things?*

No, no restriction at all. So nothing I had needed to be locked up. Later when I went on HMS Dreadnought to the North Pole I was, my results were secret until I got them declassified.

[1:43:10]

*Could you describe where you worked, interaction with colleagues and how you discussed the work that you were doing?*

In the Defence Department in Ottawa and there were half a dozen of us in the section, but there were hundreds of people in this Defence Research Board and of course I didn’t know what they were doing and a lot of them were probably doing classified research so they wouldn’t have told me anyway. But the people I worked with were all people who enjoyed
working in the Arctic and I wasn’t aware that they were involved in classified work at all, so we talked about what we did and since we came from this side of the Atlantic originally we felt very comfortable with each other, that although we were in fact, everybody there except me had been there a long time and was virtually Canadian, we could still make jokes about Canadians.

*What sort of jokes would you make about Canadians?*

Don’t remember.

*What did your colleagues think of the relationship between the scientific work they were doing and the Soviet threat, how did they talk about that?*

Well, it was entirely defensive. I mean it was the Defence Research Board and that’s all they were interested in because certainly if there were a few Americans who thought we should go after the Soviet Union before they caused any more trouble in the world there certainly were no Canadians who thought that and so there’s no philosophical problem about ordinary citizens wanting to defend their country and so I don’t think anybody had any difficulty with that.

[1:45:34]

*Thank you. I’m going to ask you about the journey you took on the boat as part of this in a moment, but could you, excluding that just for now, could you tell me what your day-to-day work involved in terms of, you know, studying the variability of the sea ice?*

Using all the libraries in Ottawa, the National Archives for records of people who’d been in the Arctic, specifically ships’ logbooks and because there were no data from people who were observing the ice for the sake of observing the ice, it was simply incidental to ships that had been there and it was a matter of deducing from the speed of the ship and the fact that the logbook reported when they were in ice how much of an impediment the ice was and I had to devise my own system of indicating the severity of the ice, whether it just slowed a ship or whether it stopped it dead or whether there was, whether it was impossible to penetrate. And I had a precedent for that in that a colleague at the Scott Polar, Terence Armstrong, had, I
think probably with support of the Ministry of Defence, had made an ice atlas of the North East Passage in the Russian Arctic. And this would have been just a contribution to knowledge of anybody, including warlike people who wanted to go up there, you’d better jolly well know how much ice there was at what times of year.

Who had produced this atlas?

Terence Armstrong, and it was published by… who published it? I think it was published by the Admiralty probably. Unclassified. And he had devised a system of analysing ice conditions from extremely poor data, that was not directly done for observing ice, in incidental conclusions from ships going up there. And so I adapted his system so that I had a precedent and an idea but I was totally alone during the work and working out my own method, and this I loved, and have been most of my life, that I was trusted to devise a system that utilised what data were available and to analyse it in such a way that you could draw conclusions relevant to the future.

[1:49:05]

What sorts of physical materials were you working on? Is it, were you in archives?

Ships’ logbooks.

Yeah.

And so I was totally free, I had my own car, I had maps of Arctic Canada this size.

That’s about a metre and a half across.

Yes. And on it I had data points that I was plotting wherever ships had been and I travelled with one of these sheets for every week of the year. And plotted on the relevant week sheet observations of ice that had been taken between 1900 and 1958, so I had these fifty-two sheets. Obviously there was very little data in the winter ones, but quite a lot in the summer ones. And… but that, there were two stages. One was simply recording against a station number that I devised, 360 or so stations, what the ice was during that week in different
years, odd years, not consecutive necessarily at all. And then I had to present these data in a way that you could look at a glance see what roughly what the average ice conditions were and what the variability was from one year to the next, in other words the chances of getting into trouble in ice. And I did that and I can show you the published results, which was the biggest book I’d ever written because it was this high, but only that thick.

*About a…*

It was essentially one sheet for each week of the year.

*It’s like a metre square, about an inch thick.*

Yeah. Published by the Defence Research Board of Canada, the people I worked for, in 1960 after I’d left because I just handed in the manuscript ready for publishing and it was published in 1960, by which time I was working for the Americans in the Antarctic. So having done all the fieldwork I came back to Cambridge and did the writing up, the final writing up, the final analysis and text - there’s not a lot of text in it because it’s mostly just the maps – in the Scott Polar and sent the results to the Canadians and that was the end of that job. And then I wanted to find another job in the polar regions.

*Was the publication classified or was that open?*

No, completely unclassified, I’m glad to say. I don’t like classified work because it’s, well it’s wasted on the desert air. [laughs] It’s only used by a small group of people. So I, I’ve never published anything that was classified, but the submarine data I had to make, argue that it should be unclassified and I succeeded and it was.

[1:53:11]

*The presence of Geoffrey Hattersley-Smith here at the Defence Research Board and also in the Exploration Club at Oxford, is that a complete coincidence or…*

It was a coincidence, yes, it was. It was the Defence Research Board who came to the Scott Polar saying could you find somebody to do this work, and so it was a complete coincidence
that he was there. On the other hand, like me he was wedded to work in the Arctic or Antarctic.

So it wasn’t as if he knew that you were looking for a job and suggested you and that’s why they came to SPRI?

I don’t know. I don’t know. It was really Colin Bertram who knew – Director of the Scott Polar – that knew that I was looking for a job. And… but there may have been correspondence with Hattersley-Smith, I don’t know.

[1:54:15]

Could you tell me about any important friends or relationships that you developed at this time, working in Canada?

No, this little group of people socialised together and Hattersley-Smith being a geologist - yes he was a geologist – was associating with people in the Canadian Geological Survey and so he brought me into a little group of a dozen geologists, all of whom worked in the Arctic, so we had that in common and we socialised with them. It was known as the Doctors’ Club and we, well, we partied together in evenings sometimes, but since we all loved the Arctic that was our world really. Some were married and some were getting married, some were not.

Any girlfriends at this time?

No girlfriends at that time at all.

[1:55:24]

Could you now please tell me about the journey that you took to see the pack ice, which I think was before you started doing the library work.

Yeah.
And if you could start by describing the journey, the route and the journey.

Well this was just generally felt that although I’d seen a lot of Antarctic pack ice, more than Canadians who’d not been in the Arctic, it might be different in the Arctic and I should therefore see some. Well, a good opportunity was the fact that the only Canadian polar icebreaker that is proper icebreaker, the Labrador, had spent a year or two in the Arctic and was going up as a matter of routine to help in making sure the DEW line – Distant Early Warning line – convoys got to their destinations. So she was going anyway and it was convenient to ask whether there was a place for a supernumerary on board. There were probably half a dozen supernumeraries; oceanographers. And so there was space for me, there was nobody else who had any responsibility for ice. I had no responsibility to the crew, I was entirely observer, but naturally the captain was a naval man, I had naval experience, and he at once saw that I would enjoy seeing more of the pack ice and so he said right, you’re ice observer and you will go in the helicopter ahead of the ship and report to us the ice conditions ahead of the ship, which of course I loved. And it meant that I was being useful, essentially a member of the crew. And accustomed to working in the navy, I could take commands without bristling and didn’t, well felt it totally natural to do what you’re told. But in fact socially it was very relaxed and easy. I wasn’t told, I was asked if I’d like to and I jumped at it. So I sketched the ice conditions ahead of the ship and whatever notes I wrote on that were all incorporated into my work because the ship’s log records in the logbook whether there’s ice in the vicinity and the speed of the ship through the ice and you can usually, usually people want to get through as fast as they can. Well, if you find the ship was proceeding at four knots you know there was a reasonable amount of ice there. It was simply that. I mean you could say what an unreliable bunch of evidence. True, but it’s all there was, scraping the barrel.

[0:59:14]

_Sitting in the helicopter sketching the ice ahead, can you remember how you did that, what you were drawing?

I was drawing a map with a scale in one’s head, but when I got it, showed it on the bridge I said well, this is five miles ahead and that was ten miles ahead, entirely judged by eye, which was good enough actually for the purpose._
Thank you. How did you feel about being assigned a military rank and I think wearing navy uniform in...

It was navy battledress without any mark of rank on it, but navies – and I’ve worked with the US navy as well – work entirely on a hierarchy structure, I suppose all military people do. And it was potentially uncomfortable for them to have civilians there who were not, except legally, under the command of the ship’s captain. Of course everybody in a ship is under command of a ship’s captain. And the question arises, where you’re going to eat. Are you going to eat in the wardroom, are you going to eat in the petty officers’ mess or are you going to eat on the mess deck because you have no rank. And in the navy you’ve got to have a rank because it’s the only thing decides where you live and where you eat. And so they decided that a person with a first degree was to be treated as a lieutenant in the navy and anybody with a PhD was to be treated as a lieutenant commander, although you didn’t have any of these indications of rank on you, but when it came to precedents and marching anywhere when you were feeling formal, then you would line up in order of rank and this caused mild amusement among the civilians but no more than that because we were guests and when you’re a guest you behave as you think your host wants.

[2:02:06]

Were you aware of what the other scientists on the boat were doing?

Yes, oceanography. That meant routine testing of ocean salinity and temperature and also hydrographers, in other words, making charts because a lot of the time we were uncharted water so keeping records of the soundings of the ship in relation to the best possible position, that was a busy job that they had to do. And then we had a survey boat. You see an icebreaker’s a deep draft ship. Our draft was, I think it’s something like five and a half metres, it is a lot of water and going in uncharted waters, there’s a risk. And so we had a survey boat with an echo sounder that went out ahead of us anywhere where we thought there might be a risk of hitting the bottom in uncharted water. And that was alright except where there was thick ice, because this was a motor launch that couldn’t go through ice and we had to be more cautious if we were in ice and in uncharted waters, slowing down was the only thing you could do, keep going slow and go even slower if the bottom was coming up on the
echo sounder. And we had one adventure when the survey boat was ahead in uncharted waters and was reporting nothing, no shallows – they were probably a hundred yards ahead – but the officer of the watch on the bridge actually saw a rock out to one side through the very clear clean water and the survey boat hadn’t recorded that because the depth on that track was perfectly alright and we were following exactly in that track, and this was very alarming of course. And so the captain went up in the helicopter and established this was… the position of this rock and the hydrographers were putting its position on the chart and it’s still very much on the chart. We could have hit it without the survey boat and at different stages of the tide, since we hung around there doing a survey for a time, you could see the water boiling over the top of it, but in the turn of the tide everything would be calm, you wouldn’t see it. But I’ve been through later in a tourist ship and it was well charted, but we could certainly see the water boiling over it.

[2:05:27]

*And were the oceanographers making sort of maps of the topography of the seabed using their echo sound?*

Yes. Well, they weren’t making them but they were collecting the material to make ‘em, that is, the positions against the clock, so a track chart with times marked along and the soundings were all in relation to time.

*And did that have a military application in terms of the DEW line or anything else?*

It had application in terms of any ship that would ever go there. I mean the Admiralty in this country has a great tradition of doing hydrographic charting all over the world for the benefit of everybody and – except close to an enemy coastline in war – these charts have all been published and the Admiralty charts are respected all over the world as being the most reliable source. Although now when other countries do charting, a ship’s captain has to decide whose charts he’s going to buy and if he learns that one country produces more accurate charts than another, those are the ones he’ll buy before going on a journey. But the Admiralty has always been historically, certainly before the twentieth century, way ahead in charting of waters all over the world and deep sea and shallow waters. I mean James Cook was charting in his day. So it’s a natural thing to do if you are going in uncharted waters, is
make a chart for the sake of everybody coming afterwards. So this was, they were just doing what they normally do, but in the course of, as a by-product of what the ship was doing, and a very sensible by-product.

_I wondered whether given this top secret document you were shown, whether there was any thought about mapping the topography for anti-submarine manoeuvring and that sort of…_

No, I don’t think so because submarine would have been crazy to come into those waters, uncharted waters and no, what that top secret report was about was the deep Arctic Ocean where you could hide under pack ice.

[2:08:25]

_Thank you. Could you tell me about any experiences on that trip of seeing Inuit life in the area?_

Yes, we stopped at a few Inuit settlements and we all went ashore and it was interesting and they spoke their language, but the common language was English, and you could talk to the locals and at each of these settlements there was a supermarket which was the Hudson’s Bay Company. The Hudson’s Bay store in all Canadian Arctic communities is the heart of the, the social heart of the settlement because that’s where everybody goes to buy food. But this was at a stage of transition of a hunting subsistence economy, living on seals and fish, to taking jobs employed by the white man, in construction, for example. So the Inuit at that time preserved their native ability to hunt for seals and fish and to build igloos and to camp out with nothing except what they had with them and to travel with dogs, and more and more of them being employed in white men’s jobs, construction. In other words, anything at the lower end of the social scale because they had poor education.

_Were they involved in the construction on the DEW line?_

Yes they were, but I don’t remember… I think some of them were. I don’t remember seeing them. The settlements we went to were Inuit settlements, but of course the Hudson’s Bay Company store was always run by outsiders; Scottish, because they had traditionally been up there. But the assistants in the store could be Inuit.
Do you remember speaking to any Inuit villagers?

Oh yes.

Do you remember any conversations?

No. I think the important point when you go into a social group like that is to struggle very hard to treat them as you would treat anybody else and not to indicate that you note that they are ethnically different. You banish that and just treat them in whatever job they’re doing. I do remember much later, many years later on a cruise ship being told by an anthropologist that it’s, Eskimo is a dirty word because it means just meat eater and the Eskimo don’t like it. And what was very amusing is that having come into the Northwest Passage from the Pacific in this cruise ship, which was Explorer, sank a couple of years ago, the first place we came to was a little Inuit settlement with a big warehouse and on the warehouse was written ‘Holman Eskimo Co-operative’. [laughs] And so not every Eskimo thought that the word was demeaning.

[2:12:41]

Could you tell me what the settlements looked... you’ve described the Hudson Bay store in the centre of the village, could you describe one of the villages that you remember most clearly in terms of its appearance?

Yes, Pond Inlet, the big ones all had their own airstrip, different sizes depending on whether they had got into the jet age, small jet age or not, and the small ones were simply gravel smoothed, natural soil and gravel smoothed by a bulldozer. But separate houses. I think later apartment blocks, in later years, since then apartment blocks have sprung up, but since the Inuit were used to living in their own homemade houses, when the Canadian government felt that it had to give them houses, they were houses to themselves, mostly small, not much bigger than these two rooms put together for everything including the kitchen.

So that’s about, just for the recording, that’s about, I don’t know... eight by six metres, that sort of size or larger?
Not larger, no. No, perhaps would have been a bit less. But yes, which was sheer luxury for the Inuit, they’d never seen anything like it. And central heating was built in and then the problem was they had to pay for the central heating. They didn’t pay for the houses, they were just given to them by the government, and because all the temptations of manufactured food appeared in the Hudson Bay store, they needed money to buy them. They didn’t have to of course because they were traditionally living on what they hunted, but the generation growing up in these houses wanted to have money to go to the Hudson Bay store and buy all the good things that you could buy there and they needed money so they had to take on jobs, such as construction or transport or anything they could get. And so the skills of hunting seals and fishing have just been progressively dying, dying out.

*Did you have any sense of how novel your landing party was, you know, a navy ship landing and everyone getting out having a look round? Was this alarming, mildly interesting to them?*

Not alarming, everybody was very friendly and they were friendly to us and I remember landing a helicopter in the middle of the main street where there were children playing and in this country it would have been, people would have been horrified that nobody had built a fence round for the helipad to keep children off, but the children, like anybody else, didn’t want to get killed and therefore scattered to a safe distance away and we landed in the high street and I got out and the children were very friendly and the helicopter went off again. I mean they were used to that, whereas in the village of Fulbourn they would be shocked and horrified and thinking how dangerous it was. That’s a cultural difference based on experience and no, we… everybody was very friendly, but you didn’t have any serious conversation with anybody, there usually wasn’t time, you were sightseeing when we went ashore.

[2:17:14]

*Did you see any more traditional relations between Inuit and the environment? You’ve spoken about the government buildings and the Hudson Bay shop and the tendency then for new forms of life to emerge, but I wondered whether you saw any evidence of traditional relations between Inuit and the landscape?*
No, because in the summer season their relationship with the ice, in other words fishing through the ice, hunting seals through the ice, that wasn’t happening in the summer. And they had dog teams but all the dog teams were ashore spanned out on chains and had nothing to do in the summer. Had to be fed and some of them had motorboats and they’d go out and shoot seals in the motorboats, to feed the dogs.

Thank you. There was one curious little story in Forty Years on Ice related to this trip where an Arctic Bay radio operator had been sacked and was misbehaving in an Inuit village and had to be removed. Firstly, was that a radio operator on one of the DEW line sites?

No, it was, it was Inuit village but there were always a few non-Inuit people in for the skilled necessary jobs like radio operators, although radio operators were being trained at the time, but the man in charge probably was a southerner and we didn’t ever hear about the circumstances of that, whether he’d been too friendly with the locals, but we took him out. I didn’t even meet him.

[2:19:31]

Did you see any of the DEW line sites as part of that journey?

Yes. We did. Really all you saw was these dishes that look as if they’re satellite dishes, well like big satellite, well, like telecommunications stations that you have on the coast in this country. Let’s say thirty, forty feet diameter dishes, and living accommodation round them and a number of vehicles, that’s all there was, and a mess hall where they all were fed lavishly.

Did you meet any of the personnel?

I don’t remember talking to any, but they were very busy and we didn’t want to hang around and get in the way.

[2:20:45]
And could you tell me about the purpose of the visit to Norway and Denmark as part of the...

That was goodwill visit, Canadian navy. I mean navies make goodwill visits in peacetime anyway, but since Norway and Denmark were both connected with the Arctic and had ice going ships and we were an Arctic icebreaker, if you were going to do a goodwill visit, Norway and Denmark would be obvious places to visit and since Greenland was Danish, they welcomed our visit and it was thought that in view of the job of Labrador, in addition to just having the navy people, they should have representatives of the other work that went on in the ship and hydrography was one, ice distribution was another. I regarded it as a lovely short holiday, I was very happy to go and we were lavishly entertained by the Embassies in both Oslo and Copenhagen. And we were open to the public to come on board.

[end of track 5]
Could I ask you to tell me about the circumstances of the switch from working for the Canadian Defence Board and working from the SPRI in Cambridge to then working for the Americans?

Again, I finished that, it was four years, job finished, wanted to find a job in the polar regions and an American geologist who worked in the Antarctic came over here for a conference and I took him on a pub crawl in Cambridge - this is perhaps a year before while I was still working on this - and at the end of the evening we found we had lots of things in common, he said, ‘Charles, if you ever need a job, do give me a call’. And so when this was about to run out I phoned him at the University of Michigan and said, ‘Do you remember that conversation we had in a pub when you said if I ever needed a job, call him’. And he could easily have said no, I don’t remember things like that in a pub crawl, but he said, ‘Yes, I remember it’ and I said, ‘Well, I need a job now’. And I knew he was working in the Antarctic so that was my criterion. And he said, ‘Give me a week to rustle up some money’, meaning a salary, ‘and then I’ll phone you and then you can come over’. Well he was an American university, what they call ‘an operator’ [uses American accent], he knew how to work the system and he phoned up the right person in Washington and said, ‘I’ve found Swithinbank and he wants a job and he has the right experience’. And so he phoned me a week later and said, ‘Okay, come over, I can pay you’. And so I went over and took a room in Ann Arbor, Michigan, which is the University of Michigan - it’s very respectable university, it’s very high standard - and worked there, but… and went one season to the Antarctic with them and had great fun. In fact I was thrown into the job of being in charge of an American party first time I got there and this chap, Zumberge, was going to be in charge but then he got an infection at the beginning and had to be flown out, so I was the next most senior person there so he left it to me. So from within a couple of weeks of arriving in the Antarctic, the first time working for the Americans, I was in charge of an American party. And that was successful and I obviously wanted to go on with similar work and I knew what I wanted to do, I knew what was crying out to be done, and that was measure the rate of movement of the ice flowing into the Ross Ice Shelf, which was a very early start on studying the mass balance of the Antarctic, the mass balance being the amount of snow that falls on the surface versus the volume of icebergs that drift away to sea. Did it balance or is there more snow than export or more export than snow.
We didn’t have many methods of measuring that at the time because it was before satellites. Well it wasn’t before sputnik, it was just after sputnik, but it was certainly before satnav global positioning. So we had to measure it wherever we could and the only thing, relative points you could measure the ice movement against was bits of rock, so you could only do this work near bits of rock. And so as soon as I got back, Zumberge said okay, write a proposal to the National Science Foundation and see if they’ll fund it. I mean I would have been in a fix if they hadn’t, and they did. And the following year they funded it because it was doing alright, and the third year and they funded it too, but by that time I had organised myself to go with the Russians to the Antarctic. So I had a job in the States in the university – what was I called - Research Associate and Lecturer.

And went to the Antarctic in 1960, November, in charge of my own project with three people that I’d myself recruited as being my team, and all the equipment that I wanted because the Americans had never travelled with lightweight vehicles, only heavy tractors, two tons upwards. And I knew I was going to work in areas where there was very bad crevassing and that would be suicide. And in fact, a few months before a New Zealand Snocat had driven into a crevasse and killed one person and injured the others and so I knew that Snocats are not bad in terms of spreading the load, but in a bad area they’re going to go through and I wanted to come home alive. So I knew about these little Canadian vehicles initially – Eliason Motor Toboggans they were called – and in those days I had wonderful freedom to buy whatever I needed. So I bought these two Canadian machines, I bought tents from England because they were the best in the world, still are. I bought hickory sledges from Norway because they’re the best in the world, I bought Norwegian skis. But the food rations I made up myself because the Americans had always lived out of tins. Well, tinned food is eighty per cent by weight water. Well, we were going to travel on the largest supply of freshwater, albeit frozen, in the world, so water is not a problem, weight is the problem and so dehydrated food is what you need. And dehydrated food is what dog sledges had always used for the same reason, they wanted lightweight so they could travel a long way. So that was no big deal for me, I took the sledding rations that we’d used in the Antarctic and slightly modified them, slightly improved with more luxuries – Cadbury’s fruit and nut chocolate – but that was alright for rugged people but for most Americans that was
considered privation. Although the thing about a British sledge ration is that it is not a ration, it’s a planned diet and if you eat too much your rations won’t last as long, but since we’re not deprived in these days you could eat as much as you like and you just opened a new ration box when you’d finished one. So the Americans were horrified at the word ration because they thought it meant limiting your intake. But the ones I had recruited, I said well, this is what we’re going to live on and it’s adequate and it’s very nice and you will not lose weight, in fact you may put on weight, which we did. And it was two pounds a day dry weight. By the time you added water it was, filled your belly adequately, but very nourishing. And I bought all the ingredients from wholesalers and packed them all into boxes and I had to do all this by September I think, and shipped them to a navy base on the east coast labelled for me in the Antarctic because they were going to go the slow way.

[0:09:27]

And then some time in October, with the three people I had recruited, I… I flew to New Zealand and then picked up an American ship in Lyttelton, which is the port of Christchurch in the South Island, and sailed south from there, making sure that I had all our equipment. I mean it was a privilege which never will be repeated because now with bureaucracy they have to approve what you have. But they knew I’d spent two years in the Antarctic and therefore knew what I was doing, and trusted me to buy the right stuff, and in fact stuff which I bought was thereafter bought by other American parties for the next generation. And so we went south by ship and I was actually commenting on one of the photographs yesterday from that first voyage south. We had the American exchange – the Russian exchange scientist that had been in practice since the geophysical year of ‘57/’58, of exchanging scientists between the US and the USSR and this was a very sensible thing to allay suspicion – and of course the Cold War was full of suspicion – allay suspicion that people were taking arms to the Antarctic and not just doing science. And so this chap was going down for the first time, he spoke English but it was a great shock for him arriving at what was in effect a US naval support force supporting the science, but in effect was a US Navy base. And he knew all about the Cold War because he was involved, as we all were, and it was a great shock. I mean the luxury of living there was a great shock, the friendliness of the Americans was a great shock for him. And he wanted to work in the field and I had to wait to be taken where I wanted to go, to these big glaciers because I was early in the season, and I’ve always wanted
to be useful and measure what’s relevant in glaciology and therefore made use of local helicopter transport to take me to different places to measure the rate of ice movement.

[0:12:24]

And one of them was to Cape Crozier on Ross Island. That’s the place made famous by Apsley Cherry-Garrard in his book, *The Worst Journey in the World*, where Edward Wilson, the doctor and biologist on Scott’s last expedition took a five-man party there in the middle of winter, manhauling, suffering temperatures of minus sixty. Horrific conditions. They all survived and they found their penguin egg. They wanted a penguin egg because if you wait till spring they’ve all hatched and the idea was that getting an egg, you might get an embryo which indicated an earlier evolutionary stage in the penguin ancestry. This later proved to be not true, but only many years later. And they got their egg, they took them back intact in a temperature of minus sixty, by which time their sleeping bags were solid, they couldn’t be rolled up because of perspiration from the body freezes in the sleeping bag and makes it like a coffin, but you still have to sleep in it. And they got back and they were all alive.

[0:13:54]

Well anyway, I went there because it was the best place to observe the rate of movement of the Ross Ice Shelf from a good fixed point, land. And he was called a glaciologist and I said oh, well how about coming with me, because otherwise he was just hanging around the base being friendly and the Americans were being very friendly to him and stuffing him full of food which he’d never dreamed of. And we were flown to Cape Crozier in a helicopter – I mean I asked for all these things and helicopters were two a penny at the time if you had a good reason. And there was a representative for the National Science Foundation there who you had to convince that it was a good reason; I didn’t find that difficult. And we had, yeah that season, this is the first season I had done, I did not have all that equipment so I was jumping ahead when I said I had planned all the rations. I planned all the rations for the 1960/61, but ’59-60 season I was going on what they had already, that is tinned food. But it was during that first season, ’59/60, that I went with the Soviet exchange scientist camping at Cape Crozier and had to use whatever I could find and since they’d been used to living in big vehicles, they didn’t have… the only tents they had were little boy scout tents with a
mosquito net. Well you don’t find mosquitoes in the Antarctic, what you want is windproof and snow-proof, but we survived, but it was a bit ridiculous. And I did all my measurements.

[0:16:11]

So we became very good friends and I saw him afterwards and when I eventually went with the Soviet expedition to the Antarctic, he came to Le Havre in France to see us off in the Russian ship going south. By that time he was an official, probably in the Embassy in Paris, and he later became high up in the United Nations Environment Programme and eventually ended up in Nairobi and retired and died, and a friend who I know here who worked for UNEP said it was well known in Nairobi that he was the KGB representative there. Well of course with the Americans everybody assumed that everybody else was a spy, but spying was no use because there was nothing to spy on, nobody had any weapons or anything. But I think he would have only served the KGB because he’d learned fluent English by being a year at a US Navy base and understanding probably a lot about the mindset of Americans. So he was never a great scientist and the UN was, and still is, a very good place to work if you want a good salary and since he’d had something to do with the environment and could speak fluent English, he was obvious person, so he rose through the ranks. And so that was the ‘59/60 season, but having come back and had to live in a tent with a mosquito net, it was then that I bought all these other things for the next season.

[0:18:11]

Thank you. Well just for today we’ll concentrate on this very first expedition, so I’ll come back to some of the things that you’ve mentioned and some that you haven’t. To begin with, could you tell me what – was it Professor Zumberge?

Zumberge.

Pronounced it.

Had in mind for the scientific aims of that very first ’59 expedition, what were his aims?
Yes. It was to repeat a line of 450 miles between one place and another on the Ross Ice Shelf to measure the rate of movement of the ice shelf. This was the biggest floating glacier in the world and nobody knew anything about its rate of movement. And there had been a military party the previous season – military just supporting the science – that had crossed the same route and had put out markers and taken sun sights to determine their position and so our idea was to repeat those a year later and see how much the movement was and also how much snow had accumulated because they’d put up markers, bamboo stakes, and measured the height above the snow and of course when you come back a year later they’re not so high because of the snow that’s fallen in the meanwhile. So that was very straightforward. The problem was that sun sights are not precise enough and although we got figures for the ice movement over twelve months the error, plus or minus figure, was just too big. So it wasn’t a great success.

*Why did he want to measure the difference between the amount of snow the year before and the amount of snow that year, and measure movement? What was his aim in doing so?*

A routine measurement throughout the Antarctic at that stage was to measure how much snow fell with the idea that if you multiplied that by the area, you could say how many cubic kilometres of snow, which compresses to ice, had to be exported. And then by the rate of movement of the ice you would see how much was being exported and see whether these two quantities balanced. Well, it was pretty vain hope because we couldn’t measure in enough places. I mean this is an enormous continent and you’d have to measure all over and it’s not until a generation later that we had satellites going over to measure the height of the ice sheet and you could actually observe the height above sea level, they can now, this sort of amount, and the rate of movement, rather than people on the surface, they can observe crevasses and they’re recognisable from one year to the next so you can measure the rate of movement in far more places than humans could ever afford to go. So now we are getting at last a handle on that balance - is it in balance or is it getting smaller. Well the answer happens to be, and this is half a century later, that it’s building up in some areas and diminishing in other areas, but on balance there’s a small loss every year.

*At that time, 1959, why was he interested in the ice balance?*
It was the thing to do in trying to understand the ice sheet, how it worked, whether it was…
you could say it’s an extension of what we did at Maudheim, that was whether there was a
history of retreat of the ice, and here a few years later we were measuring, trying to see if the
snowfall and the export of ice was in balance.

[0:22:57]

*Thank you. Could you tell me then the exact process of re-measuring? I think I’m right in
saying that it was a traverse from Kainan Bay to McMurdo Sound.*

Yeah.

*So could you describe that journey and what you did along the way?*

Well this military party had been there before, the year before and they had left these poles
and they had recorded the height and they’d given us a list of the heights of the poles above
the surface and so we were going along with our two Snocats towing sledges with food and
fuel on and a thing called a caboose which was a little hutch built on a sledge to live in, four
of us, and so as we went along we measured the height. Well, I was more proficient on skis,
certainly not downhill, but horizontally, than the Americans were and you know how water
ski-ing with a long rope you can ski way out to the side and then cross the wake and go way
out to the other side, and so going… when we got to one of these stakes I found that we
didn’t need to stop the Snocat, which was potentially hazardous for its transmission because
we were towing far too much; several tons, and they weren’t designed for that, so we didn’t
want to stop. So I was towed behind on a rope and as we came up to one of these markers I
would swing out to the side, at which point the rope would be slack, giving me enough time
to measure the stake and then get ready to be pulled away, perhaps while scribbling the
height of the stake or perhaps I had time, I can’t remember, to do it before. But the whole
point… well the Snocats were moving about four miles an hour and I had time to take the
measurements without stopping the Snocat. And so we got these measurements, were pretty
reliable, of the amount of snow accumulation across the thing, but the ice movement
measurements turned out to be not accurate enough because sun sights are fine for navigating
a ship but not for measuring the rate of ice movement. You could have made them accurate
enough had you stayed several days at each point to average your sun sights, but we were on
the move and I had been given a date by which we must be, we must arrive at McMurdo Station, the big American station, which really rendered the whole thing impossible. So we did our best within the dates that I’d been given. The dates I’d been given were because one of the party was a schoolteacher and had to be back for his school term. I mean nobody that I ever recruited could put any kind of condition on it, I said you damn well work as long as there’s work to do, but they’d compromised so I was given that date which meant that we couldn’t hang around. If we’d hung around we could have repeated the sun sights over several days and got a pretty good figure, because we had a good theodolite and we had the nautical almanac and we could have got certainly good latitude and since it was moving due north anyway, good latitude was what you needed.

[0:27:08]

So apart from the snow accumulation that wasn’t a success, but I then went home and a year and a half later organised, after I’d done my third season, organised another party to go out with tellurometers, that is electronic distance measuring equipment, and a bunch of professional surveyors and these were Germans – a lot of international work at the time and the Germans have always been good at survey. And so I organised the next season’s party and would have gone as leader of it, but for the fact that by then through five years of machinations I’d got the Russians to agree to me going with them.

So on this 1959 traverse that you say wasn’t successful in terms of the positioning, how did you re-measure the position of the stakes given that you were zipping along on skis and seemed to only have time to re-measure height?

Yeah, we didn’t… we stopped at a selection of them to measure latitude.

I see.

And then the bunch that I organised and who performed after I left had… they were professional surveyors, did very accurate distance and angle measurements two years in a row and the difference between those was very good. So we got the right answer in the end.

[0:28:58]
Thank you. And when you arrived at McMurdo Station, could you describe what you saw?

What I saw was the biggest settlement in the Antarctic and it’s still the biggest settlement in the Antarctic, and it was staggering for anybody who had worked on the sort of expedition I’d worked on, the Norwegian-British-Swedish, because of the lavish nature of everything. I mean the size of the base, hundreds of people. Well there were probably 2,000 people there at that moment. Because as soon as you bring in military to do any job anywhere, even a peaceful job in the Antarctic, you are dealing with a military structure and the structure of all military organisations has what you would nowadays call redundancy, that is to say that if half of you are killed in battle, you’ve got to carry on fighting. So you always have far too many people for a peaceful operation and the whole structure is geared to having the hierarchy and the number of people. So for an Antarctic expedition it was totally unnecessary, but they were military and that’s the way they thought. They said to support this amount of scientific projects we needed so many people. As far as I was concerned that’s nonsense, but I didn’t say so because I was a guest. And they lived very lavishly, they fed extremely lavishly: four main meals a day if you wanted them. The sleeping conditions were fairly primitive in Nissen huts, with bunk beds and central, one paraffin or petrol heater in the middle, pretty rugged by civilised standards but that gradually improved over the years until everybody had a room to himself as they have now. And so it was a great shock to see what they had and the way they lived. But everything depended on friendly relations. They knew they were there to support the science, that was their job, and so I had that in my favour that I was a scientist and their job was to help me, but only within their rank structure, so I had to ask the right person, couldn’t ask any old person to help. But the… as long as I got the support of the representative of the National Science Foundation, he was the liaison officer between science and support, you had to get his ear and his support and he would go to the military and say this Swithinbank is okay, will you support him in what he wants to do, which he did, but as I got to know the navy people we progressively bypassed that step because they knew I was seen as respectable. And I got on very well with them and they would take us where we wanted to go by whatever means was available. This was within 200 miles it was helicopter and beyond that it was getting ferried with our small vehicles, the Canadian ones initially, to a point 500 miles away and then being let loose to travel on the surface from there and picked up at the end of the season. And that was when we were totally independent travelling and it was wonderful because as I was the most experienced
person around they trusted me not to get into trouble. The thing was, the Byrd generation -
the last Byrd expedition was 1933-34 – they’d all either died out or retired and didn’t want to
go south again, so I with my recent experience was the most experienced person around in
terms of travel and what I wanted to do. So it was wonderful because they trusted me and
respected my judgement and in terms of getting to where I wanted to go I respected their
judgement because they worked the aircraft and I had to be nice to them, and this worked
extremely well, got tremendous co-operation. And some of the university scientists coming
down had read that the navy was there to support them and acted without any tact, that is to
say, tried to command them, and they didn’t get anywhere because military are humans and
they wanted to deal with you on a human level. But I had been in the military, knew that I
was dependent on their goodwill, not just commands coming down from anywhere, and
anyway I was more mature than a lot of the people there and so – and had been in the
military myself – so they did far more for me than they did for other people and I was always
prepared to explain to them what I was doing, why I was doing it and how we were doing it
and they were immensely helpful.

[0:35:29]

*Can you remember first having to convince the – I know you said you bypassed this step later – but can you remember the first time you had to convince the NSF…*

Representative.

*Yeah. Of a particular thing that you wanted to do scientifically?*

Well it was all on my project that had been approved, but of course he didn’t have all the
details of how I wanted to do it, but the whole project had been approved and I hadn’t in the
proposal, was probably ten pages, I hadn’t enumerated everything about how we would do it.

*And presumably the proposal would have been written by Zumberge?*

No, I wrote it that season. Zumberge had written the first one when we crossed the Ross Ice
Shelf, but immediately I got home from that I drafted my own proposal to NSF and so I was
on my own project the next season, very next season.
So on the… but on the 1959 one, on the first trip, were you involved in…

That was Zumberge’s project entirely.

But did you have to convince the NSF man for you and the Russian student to go out and measure movement of the Ross…

Yes, I did. I did, but again I had this tremendous advantage that I had the experience and therefore was respected for the experience. Because a lot of people were learning early on about Antarctic travel and they didn’t have enough people to teach them and so I was regarded as safe. And anyway, if anybody wanted to cross-examine me about how I was going to do things and not sacrifice lives in doing it, I’m very happy to talk about it and I did. So that wasn’t a problem. I had a great supporter in the NSF representative and so… but since so much of the navy support after initially they were told that I was okay, was by simple human relations and often in the officers’ bar in the evening. You would say, I want to do this and they’d say right, we’ll do it.

Was the… for other - you developed this particularly good working relationship – but for other people and what the scientists were doing more generally, what was the NSF man’s sort of criteria for deciding, yes that can happen, that can’t?

Well, it was really the approved proposals to NSF, the detail that was in them and whether modifications were reasonable in relation to the conditions at the time. So it was personality and he had to be liaising with the navy who again certainly knew they were working for science, but would not have enjoyed being told what to do, they were expecting to be asked what to do and I understood this so it was no problem for me, I never told anybody.

[0:39:08]

Could you say any more about the Russian exchange scientist and your relations with him on that trip?
Well, I was told when I got there early in the season that I hadn’t a hope of getting helicopters to take me out to the big glaciers [coughs], which was the main project, my main project [coughs], until other local urgent things had been done, and therefore I had a month spare. [coughs] I could have just hung around and stuffed my belly with these three, four meals a day, but that was silly and I knew that nobody had done any of the sort of observations I could do on ice movement anywhere there. Scott and Shackleton and people were [coughs] all too busy on long journeys and so I was stuck and had to find something useful to do. Well it was obvious that certain places were good for measuring rate of ice movement, Cape Crozier being one, and otherwise within easy helicopter distance of McMurdo, let’s say thirty miles, and since this involved only an hour of helicopter time, it was pretty easy to convince the navy that they would take me with camping gear out to these places and leave me there until – with whatever volunteers I had and notably the Russian – until I called to be picked up, called by radio to be picked up. And the Russian being sort of overwhelmed by the navy operation because it was so large and so luxurious by his standards, he was very happy to come with me and of course we both agreed that the scale of the American operation was ridiculous in relation to the science that was being done, but I explained to him that that’s the way the military worked and the Soviet military probably worked in the same way. But he was very much relaxed, sharing a two-man tent with me and since working with the Americans was new to both of us, we could both agree that their fabulous standard of living was slightly ridiculous and so we were allies in that direction, but we were both totally dependent.

[0:42:10]

Can you remember anything else that he… presumably you were talking in English were you?

In English. He could speak English but of course in the course of his year there became totally fluent in the way that I later learnt Russian. So he could converse in English at that time although he’d only just arrived. But a bit haltingly, which is not surprising, he’d learnt English in school. And I think my subsequent observation many years later, that he’d become KGB, he may have been asked to observe whether the Americans are doing anything they shouldn’t and the Americans who went on exchange with the Russians told me that they were all briefed by the CIA. I don’t know what the briefing was, just to see if they’re doing
anything they shouldn’t, I’m sure. And so it was no surprise that each side briefed their man going to keep their eyes open and see if there was anybody misbehaving.

*Before you discovered later that he was a KGB representative, at the time on this trip did you imagine or think that he might be observing in that way?*

Well I think in the Cold War you assumed that everybody was. The Russians assumed that Westerners were and the Americans assumed that any Russian was, which was a fair assumption in that here was this one man observing a big American navy operation, although they didn’t have guns, he was learning a hell of a lot about how they organised things and what sort of quality of people they were. And I’m sure he was asked to write a goodly report about it when he came back. When I lived with the Russians I was neither briefed nor debriefed until I wrote a… account, which I’ve got upstairs… is that going to stop now? Until I wrote an account knowing that the military would be curious about what the Russians had, what equipment they had, whether there was any sign of them doing military related stuff. So I wrote a report without being asked to, gave a copy to the Americans as a courtesy, and I think a copy to the Canadians perhaps, and one to the Scott Polar Institute and one to the Ministry of Defence in London and MoD was very grateful for it and invited me to come in and – which I was happy to do – and sit round a big table with about twenty military people all in, not in uniform, in MoD, I wasn’t introduced to any names, they were just faceless bureaucrats obviously in the intelligence system, in the military system, and they had read this report and asked me questions to expand on things I’d said about what the equipment was. But that was entirely my own initiative, I wasn’t asked to do it, but I thought it reasonable that everybody was curious about what the other side was doing in the Cold War. So I’m quite sure the Russians did the same, but the Russians and the Americans were probably required to do the same, I wasn’t.

[0:46:36]

*Can you remember what the MoD officials asked you?*

Yeah, they were interested in radio equipment, what kind of radio equipment. Well, I had photographs of it all so that was very easy to show them. That was the only thing I remember them asking about, but they were mostly pretty glum. Because I had, I mean I can
show you a copy of what I wrote, I had gone into great detail about everything that they had and I mean the Russians could see me photographing everything and could see me writing notes. I mean I wrote the specifications and models of all their radio equipment and so on and nobody objected. I think they probably assumed I was a spy anyway, but there was not supposed to be any classified work going on under the Antarctic Treaty and therefore they couldn’t stop me writing down the numbers and we were all great friends by then so if you assumed that your colleague is a spy it doesn’t follow that you should be unpleasant with him, you can be living with him. And so I don’t know what they thought, but I assume they thought I had been briefed, and they would have been very surprised and anyway they wouldn’t have believed me if I said I had not been briefed.

*Did they ask you why you were writing down numbers and taking photographs?*

[pause] I think I probably said, quite untruthfully, that I’d been asked to write a report on everything I saw. Nobody had asked me but I thought people would ask afterwards and therefore it’s sensible to be able to have an answer.

*Did the Russian exchange scientist take photographs?*

Oh yes.

*Did he write notes on equipment and things?*

I didn’t see him writing any notes and then he wintered over, I didn’t, so he had the whole winter to do what he liked. And I think he was so overwhelmed by the whole business of the navy operation that he hardly knew what to write, so I have no idea what he wrote. But there was no way of locking up what you’d written. I mean all my notes and my diary I left in an open drawer in my bedroom so that they could look at them, the Russians could look at them at any time and there was never any problem. They saw me, yeah, I took photographs of all the radio equipment, the meteorological equipment, everything I could and nobody objected because under the Antarctic Treaty, although I wasn’t an official inspector, nations have a right to inspect foreign bases.
Can you remember, apart from his feelings of being overwhelmed by the scale of the American operation, can you remember anything else that he told you about his impressions of the base and the activities?

No, I think we shared a good many giggles about the absurdity of the lavish living style, and that we could share because we both came from countries where the living standard was less.

[0:50:31]

Could I ask you about the flights that you took on this first expedition as a way of scoping out sites for fieldwork on subsequent ones? In the book you describe these flights and for example, you visit a place; Dailey Islands, Cape Chocolate, Koettlitz Glacier and Black Island and you write that ‘it was the stuff of fairytales and I long to return’. And that made me think how were you choosing sites for subsequent expeditions, what was the criteria for your choices?

Well, those weren’t sites for subsequent expeditions, those were fill-in, fill-in spare time jobs that I could easily get helicopter transport out there and nothing was known, but I had read about the area in the Scott books and had Frank Debenham, who was particularly interested in the area, so that I was mentally briefed that this would be a wonderful area to look at. So I went out there and since I had the equipment I was measuring ice movement and later ice thickness, a good many years later. And so it was simply what was easily accessible and what the US Navy would consider just a doddle and not any serious expedition within thirty miles. And they… as I got to know them, I mean I had them eating out of my hand, I was very lucky. But the uniquely interesting area in McMurdo Sound, ninety-nine per cent of the Antarctic is what we call an accumulation area, that is to say there’s snow on the surface, which is being compacted and formed as part of a glacier or ice shelf, but just in this local area near McMurdo Sound there’s this area where instead of accumulating on the surface and melting off the bottom, you’ve got the reverse: you’re freezing on the bottom and melting off the surface. And it was a bit of a mystery why this was happening, but Frank Debenham had written a paper about it which I had read, and I mean I’ve always prepared myself very carefully with the relevant literature of the area I’m going into, and I’d read that and realised that it was an interesting question. He had found the dead fish on the surface of the ice shelf and the only possible way of getting there was the mechanism he outlined, except that some
people said oh, seals had hauled these fishes up on to the top of the ice and dragged them in, but seals would not be interested in dragging them away from the ice front, they would, if they preferred chewing on the ice as soon as they got them on to the ice, six feet from the edge they would be chewing, they wouldn't want to take them further in and these were further in. So it was a fascinating area because it was so untypical and with the melting there were ice pinnacles, I called it the pinnacled ice, thirty feet or more high where one side of them had been melted away with a stream, freshwater stream, flowing on the surface of this ice shelf, and a pinnacle left between. They were as spectacular as the dirt cones that we had found in Iceland, but totally different in origin. They were more related to what the South Americans call *nieve penitente* – penitent monks - which are again differential ablation phenomena and come out as pyramids or small ridges on a glacier in the Andes where the temperature’s cold but the sun is very powerful and so they’re related, their alignment is related to the direction of the sun. And there were these things in much bigger scale than in the Andes and curiously enough, in the Himalayas – again, I’d read the literature – these pyramids by the same mechanism can be fifty feet high, spectacular photographs I’ve ever seen. So it was a wonderland in that we could wander through it, there was no danger, the water was frozen. There were lakes which were clearly… you can have a lake which has never been unfrozen because water melts off these pyramids and flows on to the surface of the ice and immediately freezes, so it’s a lake but it’s never been open water. And the result was, the ice was very, very clear and you could see a metre down into the ice and like looking through a sheet of glass, and this was just fascinating and I was trying to work out the mechanism and I later, I think... initially it was just exploring; seeing what was there and marvelling at what was there and thinking all the time about how the fish got there and it was just like a holiday for me, wandering around in this magnificent scenery.

[0:57:46]

Interestingly enough, when I had written that paper about the fish which had published in *Science* journal, later a glaciologist who was a physicist by training, he’d come along, he worked for the US Army Cold Regions Research and Engineering Lab who I worked for many years later and he examined this ice, this ablation area of ice, and said this is freshwater ice, there’s no salt in it, it’s obviously the basal layers of an ordinary glacier fed from the surface. Well, this precluded the mechanism of lifting the fish and the sponges to the surface, so I knew he was wrong and tackled him on this and he tried to fob it off, saying oh
well, they got there some other way. But sea ice, ice at sea, frozen pack ice, the brine drains out of it over a period and if you’re shipwrecked in pack ice you mightn’t think you’re not going to eat the pack ice because it’s frozen sea water and you will die of excess salt, but the fact is if you pick the highest piece of an ice floe, the brine will have drained out of it, leaving a slight tang of salt but not dangerous, freshwater and you… it was well known that you supply a ship with water by taking the tops of hummocks in the pack ice. So what had happened here was that the freezing was at a depth of perhaps thirty metres, where the ice, the salt fell away straight away, drained away in the sort of bottom part which was pretty spongy and only years later as it went up in the ice did it become very solid and transparent. And so – and this is years later – Tony Gow, he’s a good friend, went back and had another look at it because I’d told him he must be wrong, but I couldn’t explain how he was wrong, and he found that it had the isotopic signature of sea water, in other words had to eat his words and it was frozen sea water, but completely without the salt because it had frozen at such a speed that the salt had drained out of the bottom. In other words, Frank Debenham was right in his paper about 1914 or ’18 and so I wrote to him and told him and he was thrilled.

So you did do some scientific work at this pinnacled ice site?

Only by keeping my eyes open really. Not by any measurements, no. No, I would say that I was a glaciological tourist on that, that I was looking for anything interesting.

But you wrote a paper based on those observations?

I’ve, yeah, there was firstly the paper in journal Science and then later I wrote a conference paper about the area, yeah.

Are you saying that you wouldn’t regard that as truly scientific work when you say that you were...

Well it was scientific alright, but it was sort of haphazard, unplanned and I mean I’ve always been after contributing to knowledge in any way possible, from the Iceland expedition onwards, and as I told you, in the Iceland expedition I produced a paper for Meteorological Magazine or Weather, I forget which, and also for the Journal of Glaciology and the plans
that I am lending you were sort of rather ambitious and we didn’t get a lot of it done because of the conditions. But that was because we didn’t know anything about the conditions and this was pretty typical of undergraduate expeditions, that you bite off more than you can chew. But all the work round McMurdo was just to get away and do something useful.

[1:03:34]

Yes. And on other flights you were, you were actually looking for sites for future scientific works on other expeditions. What was the criteria for choosing those, how would you assess the quality of a site from above, from the air?

What I was looking at was the trafficability of the crevassed areas, so I mean they were tremendously generous. They gave me this four-engine Neptune; two piston engines and two jet engines, and flew, well it was well over a thousand miles, probably two thousand miles, right round the Ross Ice Shelf, so that I could see what it looked like and along the foot of the mountain range where I was intending to put my markers across the glaciers, we went past there and took photographs with an official survey camera at the side and that showed all the dangerous areas and I could avoid them later, because there were no maps and the aerial photos were the only thing I had. And they were tremendously generous because they developed these films in a lab in McMurdo Station and gave me prints the next day at no charge and I’ve got them in a drawer here still. But it meant that I was far more prepared in terms of the terrain and where not to go.

[1:05:25]

Would anyone be able to look down at the ice and see which bits are dangerous and which bits are not or is there a special skill in knowing what you’re looking at, flying above as you were then?

Well if you haven’t travelled over the surface anywhere in the Antarctic you might have some difficulty, but to anyone who’s travelled over the surface – I mean that’s why the Americans got me to write the satellite image atlas, they didn’t have anybody who could combine a lot of surface experience with looking at the satellite pictures – and some people might have, but for me the aerial photos told me everything I wanted to know and they were
in fact, I mean they weren’t as a map projection vertical, but they showed where the nasty places were and places to avoid. So that was tremendous advantage and this was done for me during the first season before I’d even drafted the proposal for the next season, which required going along this mountain range. So it was pure generosity that I was trusted not to be going for a fun sightseeing flight, which would have been much frowned upon of course, but there was a damn good reason for asking for the flight. I mean everything the military does costs a lot. I mean probably that plane cost a, what, £10,000 an hour and I think we flew eight or nine hours round the ice shelf, so if anybody had been adding up the pennies it would have been bad, but they were not in those days.

[1:07:32]

*Obviously this raises a question of how this first experience of an American expedition, how was that different from the Norwegian-British-Swedish expedition?*

Totally different. In NBS Expedition we had just these Weasels and dogs for transport and that was severely limiting in what and where we could go. We didn’t have aerial photographs ahead of time so the terrain was a complete surprise like any explorer. And just a total contrast to the standards the Americans, in terms of what they could do if they wanted to, was way, way ahead of anything we’d ever had before. To me it was a wonderful luxury to be able to sensibly plan what I wanted to do the following season. I mean fantastic generosity, money no object, to give me this flight round the ice shelf. Learned a great deal. And that was just trusting that I was not having a free sightseeing flight.

[1:09:08]

*Were there scientists who, were there other scientists then who were likely to use the system in that way, as a way to have a look round or…*

There probably were some, yes. I mean the worst – we used to refer to tourist people who were not tourists, but they were scientists taking advantage of their position to go sightseeing – and the worst tourist trip, which was quite easy to do, was to fly to the South Pole because there were planes going in every day and you had to strike up a friendship with the air crew and they would take you to the South Pole. Well that I regarded as a tourist trip. I would
have loved to go and I did go years later, but any of the scientists who’d gone to the South Pole I designated as tourists because they were obviously taking advantage of this ability to go and sightsee at the South Pole. And the other two no-nos were the Scott and Shackleton huts. The one right at McMurdo Station, the Discovery Expedition hut, you could walk round but you had to have a key to get in, to stop people looting, but the other two huts were more than thirty and forty miles away, you had to have a helicopter to get there. And so those I regarded as tourist flights and it was some years before I accepted one that was going to the Shackleton hut and just went as a sightseer. But I was very careful never to ask for an obviously sightseeing flight. I love sightseeing. Well, there was one thing, these single engine Otters that were flying butterfly nets – did you read about that – they had spare seats and I only had to convince the pilot, there was always plenty of load factor, load room, that I wanted to go along and those appear sightseeing, but enormously valuable in understanding the landscape and I went a good many hours on those. It was very cold because both the side doors were off and there was no heating, but I was getting fabulous view of the countryside and I’ve got many photos that I took on those flights. What rather annoyed me on those flights is that they were filled up with navy people who got flying pay, extra pay if they flew, just for the number of hours they flew for any reason, and they got in the aircraft with a sleeping bag and bedded down in the sleeping bag for the whole flight. So for them it was… for me it was a waste of time to see what they did and would have been a waste of time, I don’t think the pilots would have gone along with it if I’d taken a sleeping bag because they knew I wanted to look at the landscape. But these people were simply taking up the load in order to get flying pay and that I looked down upon.

*Did you - you took photographs from the side – did you do little drawings and notes and that sort of thing on these, when you were looking at the landscape on these Otter trips?*

No, I was looking at the landscape and photographing, not drawing. It was not an area that I was going to work in, but again, it was the area that Scott’s geological parties had worked in so I knew all the histories, I knew the geography and just from that point of view that having read the history it was a thrill to be getting there in an armchair, so to speak.

[1:13:37]

*Are there key glaciers that you were seeing on these trips...*
Yes, yes.

…the named ones that I could...

There was the Ferrar Glacier that the… a party went right to the head and found coal, it was
the first place in the Antarctic where coal measures were found and was a route up to the
plateau. And later I took the granddaughter of Ferrar on a cruise to the Antarctic. I just
thought it’d be interesting for her as her grandfather was a distinguished geologist with Scott,
that she should see and she was very keen to see the Antarctic. So again, I mean I, from long
before, well probably – no, both before the first expedition and while doing my D.Phil - I was
reading a history of the Antarctic, history of exploration and I bought a lot of these books
because I couldn’t find them in libraries and amazingly some of the classic books were not in
the Oxford University Library, the Bodleian Library, they just weren’t there. And they were
so cheap at the time, five pounds or something, so that was the basis of my library, books that
I needed in writing. And in my thesis there are plenty of references to anybody, everybody
who’d been there before, because it supported whatever argument I was making.

[end of track 6]
Could I start today by asking you when and where you met your wife?

I met my wife in the Stefansson Library in Dartmouth College, New Hampshire, USA in the course of my work on the Northwest Passage ice distribution and it was one of the many libraries that I visited to get records of ships in the Arctic. And she was standing in for Stefansson’s wife who was the official librarian, because he was very old and needed looking after, and so in fact she introduced me and guided me in the library and there was an obvious attraction from the very first day. But I was only there for a week so that it couldn’t proceed very far in that I’m a slow worker in the courting world.

How far did you get in a week, what did you do in the first week?

Oh, we went for drives in the country on the weekend and found that we had a lot to talk about because she was from Alaska and so I was interested in Alaska, had never been there, and because she was working with the Stefansson [coughs] she was interested in exploration and he was all Arctic, but he took an interest in the Antarctic, he’d met Shackleton, so there was a lot in common in the things she was dealing with and thinking about.

Which year was this when you met her?

1955 or ’56.

And when you said that the attraction was obvious from the start, what do you mean by that?

Well, you have had a woman in your life and you know that these things happen. They may grow on you fast or slow and she couldn’t grow fast because I was only there for a few days, but we corresponded for years after that until eventually I plucked up courage and went down on bended knee.

After the first meeting with her and you said you were there for about a week, and during that first week you went out on drives?
Mm.

And then you presumably had found the data that you needed from that library...

Yeah.

... and you had to go away again, how long till you next saw her, sort of together, how long till you were...

Probably a year, but we were corresponding.

Can you remember the sorts of things that you wrote about?

... We wrote about things we’d been doing and things we were interested in and she was interested in poetry and I liked some poetry and so it was on the state of the world, I forget what. I’ve probably got some of her letters still.

[0:03:55]

Is it, am I right in saying that she had a child?

She had a child who was at that time probably seven years old. Her husband had died of a heart attack in McKinley National Park in Alaska, he was geologising there and out of the blue, although he’d just had a medical exam and declared fit, he died of a heart attack and so there she was in a log cabin no bigger than this room, in Alaska, I suppose a mile or two from the nearest people, alone with her child and wondering what to do. And so she was resourceful, in that circumstance you die if you’re not, so she then went back to civilisation in the east and probably stayed with friends and then decided the only way she could survive on the money she had was to go to Spain, and she didn’t know for how long but it turned out to be a year before she felt fit enough to take a part-time job and she was found a part-time job by friends. And so went back and for a few years was [coughs], was Dean of Students at a high class private school outside Philadelphia [The Baldwin School], and she’s always been very good at dealing with people of all shapes and sizes and so she was much respected in that job which was really the same as a matron, that you looked after the girls and all their
problems and she was good at that and her payment was not only being fed and housed, but having her daughter go to school free of charge.

Was that before or after the job as a librarian when you met her?

That was after. After, yes.

[0:06:42]

You saw her a year and it was a year before you saw her again, but in the first week did you meet her child?

Yes I did, yes.

And when you went on the drives did the child come with you?

No, I think she was being looked after by somebody else.

And at that time she was seven years old, the little girl was that?

I think so, about that, yes.

Okay. And when you started working for the Americans, University of Michigan, were you able to see her then at that stage?

I did, because I had business in Washington at the National Science Foundation and Philadelphia’s not far from Washington, so every time I had business in Washington I went to visit her.

[0:07:33]

Do you remember which year you proposed, just so we can get the timings in relation to this?

Yes. It would be… it would be April 1960.
Would that have been after the first American expedition?

Yes, yes.

So when you came back from that first American expedition, where did you then live between the first expedition and the second?

Ann Arbor, Michigan.

So you still had the room in the university at that time?

Yes. And a job there, I was paid for three years while I was there until I resigned.

Could you tell me then about anything you can remember of spending time with your future wife and her daughter in that period between the first expedition and the second for the Americans?

They were just snatched visits of a few hours. And that’s all that we could do.

Would you be able to say what you might have done on a typical snatched visit?

Take her out to dinner, once or twice we booked a motel room and slept together. But all very brief because I’d not made up my mind at that time to propose to her and it was only after the first 1959/60 season that I realised that time was marching on and it was time that I got married and I had never found anybody as compatible as her and so I proposed.

What made her particularly compatible?

Very easy person socially and able to take an interest in all my doings, but aided by the fact that she had lived with [coughs], with the greatest Canadian American explorer, that is as his assistant librarian, and so anything to do with the polar regions was something that she knew about. And so we had lots to talk about, but life in general and I suspect that when I proposed to her I knew that she did have a great respect for the education system in Britain
and it was clear that sooner or later, as most people do, I would return home and her daughter would get a good education here.

[0:10:57]

_You, when you were a little bit younger you were reluctant to form sort of permanent relationships because you felt that your career was going to involve a lot of travel and moving around and that having a permanent relationship, especially the responsibility of looking after a family, would be a sort of weight holding you in a particular place. What had changed by this time, by 1960, that made you think that you were going to go for this and propose?_

I had a job which was relying on an annual grant from the National Science Foundation but they had indicated that if I wanted to stay I could, so that in effect I had a permanent job and therefore felt able to look after a wife and child.

_Can you remember at this time then, between the first and the second expedition, anything of your relations with your wife-to-be’s daughter, things you did together, what you talked about, that sort of thing?_

No, because time with her was very short and so I can’t really remember anything. I mean we liked each other from the start, I could see that.

_What made you realise that you liked each other?_

What does? Having things to talk about, but I can’t remember what.

[0:12:48]

_So that I can sort of arrange future questions, when was the first time that you were living together?_

That would be August 1960.
Where did you – so this is before the second expedition?

Yes.

And had you, you’d proposed at that stage and you’ve…

I had, yes.

And you found a place where you could live together, all together, the three of you?

Yes.

Where did, where was that?

Ann Arbor, Michigan where the University of Michigan is.

But rather than being a room in the university, was this somewhere...

Oh it was a private apartment. [coughs] Sorry.

In the same way that you did for your various family homes as a child, could you remember that in enough detail to take me on a tour of that house, the first house that you shared with your fiancée and your step-child?

Well it was an apartment really. I think it was two bedrooms, a sitting room and a kitchen probably.

Right, okay. Do you remember how it was decorated?

No.

[0:14:14]

So you’ve now proposed to your wife, do you remember the date of your marriage?
The seventeenth of August, 1960 in Seattle.

*So you actually married between the first expedition and the second?*

Yes.

*The proposal and the marriage all happened pretty quickly?*

No, she took a bit of time to decide because it was a very big step, and so she spent the summer with her family in Seattle and then when she decided she phoned me up and said she’d decided and I was very, very pleased.

[0:15:05]

*Could you describe your wedding day in as much detail as you can remember?*

Yes, it was in a Protestant Episcopal church in Mercer Island and the guests were family and there was a big family, I mean she had three brothers and a sister and they’d had children, so all the family came to the wedding and we had, each had separate pep talks by the vicar, as is quite common, about the meaning of marriage. And it was a very… we were both extremely self-confident so that when asked whether you take this man or woman to be your husband or wife, we both said ‘yes’ in a very loud voice, which the whole of the congregation could hear. Sometimes you go to a wedding and the bride is so nervous she whispers. [laughs] But… so, and then a reception and wedding cake in her brother’s, one of her brother’s houses, and they had lent us one of their cars, a VW Beetle, to go on honeymoon, leaving her daughter with her uncle. And it wasn’t a very long honeymoon, I think four or five days during which we camped out on Olympic Mountains in the State of Washington, far west of Washington, lovely hiking country, and camped out and I remember deer coming to the tent door and sniffing at us. But we had magnificent hikes and we had sleeping bags and we bathed every morning in mountain lakes, didn’t spend long in because it’s about 6,000 feet up and the water was pretty cold. And I remember we then – there was no road between the two points that we wanted - there was a road head here and a road head there and we hiked between the two and when we got to the other one, because we’d left our car at the first one,
we had to hitchhike down to civilisation and I well remember the first time I, in talking to the
driver in the car, referred to ‘my wife’, it was the first time I’d used the term. And then we
arranged to rescue our car and travelled further along the Olympic Peninsula and then back to
Seattle, I forget how many days, but probably four days. And then we, I think we all flew to
Ann Arbor.

[0:18:58]

Thank you. Did your, any members of your family from Britain come to the wedding?

No. In fact I hadn’t told any of them. [coughs] I hadn’t told any of them about it and I sent
a telegram to my mother either one or two days before the wedding saying that we were
going to get married, and we hadn’t been in Seattle long enough to get a wedding licence, but
one of her brothers being a lawyer, he had a friend who was a judge, and he said well we’ll
fix this. So we had to appear before a judge and it was very rude of the judge because he
interrupted a case he was hearing to see us for two minutes in order to be able to give us
permission to marry because we hadn’t been there long enough and he said to me, staring me
straight in the face, ‘Does your mother know about this?’ And I truthfully said yes, because
I’d just sent a telegram. And so we then got a marriage licence.

Why did you not invite your family?

Well, in those days it’s a lot of money to travel and none of them had big money and so it
didn’t cross my mind really. No, travelling 6,000 miles would have been an awful lot of
money for the family.

Had any of them met your wife?

No.

What did they say to you about the wedding after it had taken place? Do you remember?

Well they accepted it as they had to and I sent them photographs, but that’s about all I
remember.
Did your mother say anything to you about it, can you remember anything?

Oh, they all congratulated me. Yes, I think they were happy and very keen to meet my wife, which didn’t happen for three years afterwards.

So that would have been when you came back from America?

Yes.

[0:21:49]

Can you remember what your father said about your marriage?

He was dead by then, killed in a car accident.

What year was…?

He, I think it was 1956 he lost his life. [coughs]

Which was when you were working for the Canadians?

Yes.

Can you remember hearing about that, how you heard?

Well actually I was in the Scott Polar but working on the job for the Canadians, and so I was here and I was just told that there’d been an accident and he was in a hospital in Kent and I visited him once or twice, but he never regained consciousness and died in the hospital.

Can you, are you able to talk about your feelings at his death?

Yes. Well we had lived apart for so many years. It wasn’t a big deal, it was just losing a parent is a sad event, but I took it all very calmly. I mean you know that your parents are
going to die sooner or later and this was a sad way to go but he didn’t suffer any pain because he was unconscious until he died.

What were the circumstances of the accident, do you know?

It was on the A20 outside Maidstone, between Maidstone and Ashford, and there was a hilltop and by that time he’d lost a leg from septicaemia and he had an electric wheelchair which had enough electricity to go into Maidstone and come back again, and there was this blind hilltop on the A20, it was a very fast road at the time - there weren’t any motorways then - and he knew it was dangerous because on the top of the hill he had to turn right to go down to their house and he was going very slow and the traffic was going seventy miles an hour or more, and he had written to the local council saying this is a very dangerous hilltop, you should do something about it, and then he’d written again and nothing had been done. And then when he was killed they cut the top off the hill so that the visibility for the motorists was a bit further.

Was he in his electric vehicle?

Yeah, yeah. I think he was turning across the road, probably hold out his arm and turning, but with a car coming very fast from behind, wiped him out and I remember going to the inquest and sort of nodding to the driver who’d killed him, but we didn’t have any words, there was no point. But… and… so that was the end of him.

Having died suddenly, was there anything that you sort of wished that you might have said to him?

No, I don’t think so because our interests were so far apart. I respected him a great deal because he was a scholar of Latin and Greek and was contributing to a Medieval Latin dictionary right up until the time he had the accident, and like most people he couldn’t understand anybody wanting to go away to the polar regions, and so he accepted that because I was grown up. And so we had very little to talk about but there was a lot of mutual respect because he could see that… I could see that he was good at his job and I think he could see that I was good at mine.
What made you feel that, that he sensed that you were good at your…

It’s something that you feel, I don’t think you can put your finger on it. It happens with meeting people everywhere, you either quickly find that you have respect for each other or that you have nothing in common and with a parent you always have something in common.

[0:27:04]

Do you remember the last time that you did see him before he died?

Yes, it was in Bearsted in the, my mother’s bungalow and four-acre farm and he was working on his Medieval Latin dictionary and he only appeared in the sitting room for meals and then went back and worked. So I saw very little of him, but I think by that stage he and my mother were tolerating each other because they’d been married for a very long time, as couples do, they may not have much in common but they are living together and she was feeding him and he was helping her in the farm.

How did your mother react to the death of your father?

I don’t remember. We… we had no choice but to accept it, but she was very capable of looking after herself and the animals on her farm and so she just carried on as she’d been going before. And so it was not a great deal of change really because they’d both been living together but going their own way in terms of their interest.

Do you remember any sort of signs of emotional reaction from her?

None at all.

At the funeral?

I forget if there was a funeral. I don’t remember a funeral at all. It would have been a cremation and probably I would have been the only person who went to it, but I don’t remember that. I mean as a family we don’t set much store by funerals and in fact I’ve instructed my daughter to try and avoid a funeral when I die and if friends want a memorial
service later, well then have one later, but when our daughter died in Seattle, four years ago
now, her husband did exactly that. You don’t have to, even in America, you don’t have to
have a funeral. You can, as long as you’ve got the doctors’ certificates you can cart the
deceased off straightaway to the crematorium with no ceremony and then because we were
there and didn’t want to hang around, they had a memorial service about ten days after she
died. And I thought this was a very good idea, because having to pay for a funeral and then a
memorial service later is completely unnecessary. The memorial service can be an enjoyable
occasion because you’re celebrating somebody’s life and a funeral is miserable with a coffin
disappearing behind curtains. So I can’t even remember if we had one for my father, but if
we did I was probably the only person who attended the cremation, because my mother
would have been busy looking after the animals and was not sentimental about these things.
Her husband was dead and that’s that. It’s rather the same as my matter of fact way that
when you’re dead, you’re dead and it’s nothing to get excited about. But a memorial service
as we had later for my wife when she died in Fulbourn, that was a memorable occasion
because I never knew how many friends she had until the church was packed out and the lord
of the manor said that he would have the… the meal afterwards in the manor, which he didn’t
charge me at all, so… because they were good friends. So I think that was a very valuable
occasion for everybody, but a funeral I don’t find valuable.

Did your mother have a similar view?

Yes.

Can you remember anything that she said when your father died, to you?

No, I can’t.

[0:32:25]

I wonder whether you could talk now about the transition from the first expedition with the
Americans to the second, given that in the meantime you’d got married and moved in with a
wife and child. Could you then talk about the process of leaving to go on the next expedition
and about anything, any different feelings given that you were now married and living with a
child as opposed to just going away as a single man?
Yes, I can remember. It was painful leaving, but she had accepted that it was part of my job and I loved the job and so there was never any discussion about it, I just… we both knew that I was going because that’s what I was in the university for, doing by that time projects that I had planned myself and equipped myself, so it was very much my operation from 1960 onwards. And she having lived alone for years and years, it was no big deal to live alone for three or four months.

*Can you remember the moment of leaving, where you were?*

… It was probably from the Detroit airport and we would have had a tearful parting, but both very determined to go through with it, so I don’t remember actually.

*Did you refer to your stepchild as your daughter at that time?*

Oh yes, we had set about… the daughter had asked to be adopted because she wanted to change her name to Swithinbank so that we were a family together, and I forget when that was, that quite probably was in ’61, that we went before a court and the memorable thing about that was according to American law [coughs], she was made a ward of court in the space of one minute and then she was asked whether she wanted this man and this woman to be her parents. And we often had a good laugh about what would happen if she’d said no, because she would be saying no to her biological mother, but she didn’t, she said yes.

*And do you remember how you felt about leaving your daughter then?*

Yes, well it was leaving the two of them really. No, we were a family by then and it was slightly painful parting, but accepted by both sides as being inevitable.

[0:36:14]

*Thank you. Now in terms of planning this second expedition, I know from last time that you did very well in procuring lots of different kinds of equipment from different places to get the best set-up that you could, but could you say a little bit more about the personnel. So in*
putting your team together, what attributes were you looking for – could we start with
scientifically – so what were you looking for in your team from a scientific point of view?

The only technically qualified person I wanted was a professional surveyor because part of
the geometry of measuring the rate of movement of these glaciers involved having a map to
scale and so we needed a surveyor to make the map and the government, the US Geological
Survey, is responsible for mapping, they lent me a surveyor free of charge, so to speak, and
they continued to pay him his salary because they were just beginning to think of mapping
the mountain range and this all contributed to it. So he was the only qualification I needed
and otherwise two more people just to make up a four-man party. And one was a
palaeontologist at the University of Michigan who hoped that he would be able to find
something interesting in the rocks, but he was employed as field assistant, not because of his
qualifications. And then another one, Jack Tuck who had been the first winter at the South
Pole when the Americans set up the South Pole Station in 1957, he had been the navy leader
as a Lieutenant (j.g.) of the crew there setting up the station and so he wanted to go back to
the Antarctic - most people who go to the Antarctic want to go back again – because he loved
it. And he was… I forget how I found him, but everybody knew I was looking for competent
people to come, so that made up the four.

[0:38:59]

Thank you. In as much detail as you can, can you describe the three-day gathering that all of
the field personnel that the USARP asked you to go on?

Yes, it was great fun really. I was probably the most experienced Antarctic hand.
Everybody had to attend this regardless, but most of them were first time to the Antarctic and
there was a lot to tell them about in terms of survival and how you did things and…

[pause – microphone dislodged?]

[0:39:51]

Where were we?
You were describing the three-day field course that the USARP required you to go on before setting out on the second expedition.

It was fun. There was somebody demonstrating the field clothing and there were, there was some rope work, climbing cliffs and abseiling down, setting up a tent. But mostly sort of bureaucratic lectures about the way things are, were run in the Antarctic, but I think we all enjoyed it enormously because there were good parties every evening and everybody was learning a lot, not only about what our lecturers were telling us, but also about each other. And these were the people that you were going to live with so you needed to get to know them.

Can you remember what the USARP personnel said to you not to do in the field?

What not to do? No, I can’t remember what not to do but safety was an important part of it, never travelling around alone, which is to me just obvious, and not enough about how to set up a tent. I remember the ’61/62 season, the two geophysicists that we had from the University of Wisconsin I think, had never set up a tent in their lives and made a total hash of it, which was embarrassing. But no, I can’t remember about that.

Thank you. Did they give you any guidance on the way you were supposed to go about your scientific work, were there any standards?

No, because I knew exactly what I wanted to do and it was I who proposed the work and the work had been approved by the National Science Foundation. So it had gone to referees, sixteen different referees, so it was well… all the NSF proposals went to sixteen different referees and if there’s somebody who didn’t like you they could stop you, but with sixteen it would be quite difficult for one person to wreck it.

Did you have to sort of sell what you wanted to do in a particular way in order to get it through the NSF?

No, I wrote a proposal for what I thought was a plausible project consistent with the things we wanted to know about the Antarctic at the time and…
This is a good time to ask then what were your aims for this second expedition?

The aims were to measure the amount of ice coming through the Transantarctic Mountains and we knew at the time that the biggest contribution to the Ross Ice Shelf might be from the eastern side where there were no mountains, it was ice streams pouring into the ice shelf. But in order to measure any speed of movement you’ve got to have fixed points, relative to which to measure it and that’s why I started on the west side. I mean a decade or two later, they were measuring on the east side with satellite navigation because you didn’t need fixed points for that. But we needed fixed points; it was elementary triangulation – measure a baseline and then take angles to your aluminium stakes that we had set out across the glaciers.

And would it have been impossible at that time to have done movement studies on the eastern side…

Yes.

… in the absence of any rock?

Absolutely impossible. I mean you could use sun sights, but not nearly as accurate as you felt you needed.

Thank you. Now I’m quite interested in the hour you had with a psychologist before you went away and the hour you had with the psychiatrist. So could we start with the psychologist – can you remember what the psychologist was asking?

I can’t distinguish between the two, but it was two hours of questions and they didn’t know that I’d ever been to the Antarctic before, they probably assumed that I had not. And so I was completely confident in answering all the questions. Certainly tests to see whether you were sane, Rorschach test, ink blot test where you – have probably done it yourself – where
you have a lot of dots on a page and depending on whether you’re colour-blind or not you read certain numbers in the dots. And then there are other things which are, depending on your state of mind, sexually suggestive and I suppose they want to know whether you were honest or whether you didn’t want to answer because it was embarrassing and I just answered everything I was asked because I was not worried. But I do remember, and I wrote in my book, that at the end of two hours of this grilling there were five minutes left over and the professional said ‘What do you do for a living?’ And I said, ‘I work in the Antarctic’ and he said, ‘Oh, for Christ’s sake, why didn’t you tell me? What am I looking for in these people?’ And I said, ‘You’re simply looking for nutcases, that all normal people can do the job’ and so I perhaps helped him in some small way. But his formal tests were designed to find out if you were mentally unstable I suppose. But that was fun and on the same day we had a very thorough medical exam.

Did the psychologist attempt to psycho-analyse you without using tests, so in other words was he asking you questions about yourself?

Yes he was, but I can’t remember what they were. He was certainly intending to find out whether you had any hang-ups or whatever, and anything that might make you difficult to live with, or anything which might make you liable to fail under stress. I’m sure he was looking at all those sort of things and he couldn’t find anything wrong with me.

[0:48:29]

Okay. Could you take me through the second season’s work, step by step to begin with? So this is the second season’s fieldwork in the Antarctic.

I wanted to fly down as early as possible because there was so much work that had not been done, quite apart from our project, around the base. There were many areas where the ice was unexplained and one of the first things needed was to measure the rate of movement. And so I went down in early October and said right, when can I start on my main job and they said oh, you’ve got to wait a month for one reason or another, and I said well, can you take me to local places and they said yes. So we were helicoptered out to local places of interest and that was when we found the headless fish on the ice, which we at once summoned a biologist to come and look at and that led to my first paper in science, the
American Journal Science [Vol.133, No.3455, 1961, p.764-66], jointly with the biologist at the end of that, after we came home. And I was measuring the rate of ice movement, there were plenty of fixed points around there, islands, measuring the rate of ice movement at a number of different points and that was all published later. But that was to fill in time. I mean everything was new to me and in terms of glaciology, new to the world because nothing had been done there. And so I was making absolute maximum use of the time and one of the things I did was to go out with this Russian exchange scientist, Sven Evteev, because he called himself a glaciologist and was at loose ends because there was no real job for the exchange scientists, they were there as observers really and they all wanted to take part in some work and the Americans later wanted them to take part in their work, which of course for an exchange scientist is exactly what you want, you don’t want to be a supernumerary hanging around. So when I invited him to come out with me, be taken out by helicopter with camping equipment, he was very happy to oblige and we went first to a place in McMurdo Sound called the pinnacled ice, which I had read about in Frank Debenham’s papers. And after that we went to Cape Crozier, which was on the eastern end of Ross Island where you could see over on to the Ross Ice Shelf where it was moving its fastest shortly before it broke off into the sea. And I got the helicopter to take me out on to the ice and land in I think three places and put up a stake, either bamboo or aluminium – I forget – and then come back to the land and measure a baseline with the Russian and intercept the stakes from both ends. So again, that work was published years later. And it was completely unknown, what the rate of movement of the Ross Ice Shelf at any point was, but here we could get the sort of fall off as you went into the friction of the side and when you were two or three kilometres out you were pretty much dealing with the full speed of the ice shelf. But those were all things that needed doing, but were not on my proposal.

[0:53:08]

But other people who’d never been to the Antarctic before were sort of confused by landing up in this big station where you were not told what to do, you… in my case I knew what I wanted to do, but people who had been recruited as field assistants somehow were completely shocked by landing up in what was in effect a US Navy base with ten times as many – more than ten – twenty times as many navy people as science staff and it was confusing for somebody who probably recently left their parents for the first time, but having gone to some college. And so there were people who were sufficiently confused that they
stayed in their sleeping bag all day, didn’t know what to do. And they were overwhelmed by this totally new experience with nobody telling you what to do. When their supervisors, the head of their party appeared sometimes a week or two later on a later plane, then they began to know what they were going to do. But I do well remember young people, young graduates from a junior college who just stayed in their sleeping bags because they were so confused by the whole experience, and then people get very bad coughs because the dry air, you’re not adjusted to the very dry air, and so they did an awful lot of coughing, I think we all did a lot of coughing, but I just ignored it. But that’s what I remember about the start of the first season, that I knew that nothing would be done if I didn’t do it and nobody would help me unless I asked them. But once the US Navy people found that firstly I was very friendly with them because I had no… I had no seniority to tell them what to do, everything had to be politely asked, and so the best thing was to go to the officers’ bar in the evening and chat them up, especially the people who had the helicopters. They were on their defensive against people who just wanted a plane ride, some of the newcomers did but - just for fun – but when they discovered that I knew exactly what I wanted and where I wanted to be taken, they were very helpful.

[0:56:33]

Thank you. Now on this second season, 1960-61, was there any difference in the way you were measuring ice movement then compared to when you very first went to the Antarctic with the Norwegian-British-Swedish Expedition?

Well you see, the measurements on the Maudheim Ice Shelf had no fixed points, so they were simply measuring the deformation of the ice shelf relative to the centre stake of the pattern and the centre stake in the whole thing was moving and we didn’t know how fast it was moving, so it was a study of deformation of the ice. But inland where we measured ice movement, yes, we were measuring from rock stations, so that was conventional triangulation.

I wondered whether in the meantime in the time difference between the two expeditions, there’d been any changes in technology or pieces of equipment?

No.
So it was the exact same process?

Er, yes. But in the third season with the Americans, they were doing a triangulation and trilateration down the mountain range to get fixed points all the way down the mountain range and they had not only theodolites which had been in existence for, well standard equipment for half a century, but tellurometers which are electronic distance measuring equipment. They had those and were working along the mountain range with those. We didn’t have a tellurometer, we just had a theodolite.

[0:58:35]

Thank you. Could you then describe the process of actually setting up the aluminium pipes in a row and perhaps we could use an example, the row that you put across the mouth of Beardmore Glacier. I wonder whether you could step-by-step take me through the process of setting up the line of stakes?

Well we left one man, Tom Taylor the professional surveyor, on the mountain, Mount Hope, to follow us through the telescope of the theodolite because he could then see where we’d set up the stakes as we called them, and if he didn’t follow that it would be like a needle in a haystack trying to find them in the telescope later. And so he took angles while we were setting out the stakes and we crossed with the motor toboggans, as we called them at the time, which are now called snowmobiles, and stopped every mile and a half I think and drilled a hole and set up the stake and then moved on. And it was potentially hazardous country so that we rode on skis the whole time and we drove the vehicles from behind and went right across until we got into crevasses on the far side and then stopped and came back and then we all were involved in measuring a baseline and helping with the triangulation. That was the Beardmore. And then the following season you see, we knew roughly where to look and we came back and measured, re-measured the angles and calculated by simple trigonometry the movement in the interval, twelve month interval.

Thank you. Now you said two things that people listening to the recording might not understand or want extra detail on – the latter really, extra detail. When you said you
travelled every mile and a half and then set up the stake, can you just unpick the process of setting up the stake?

We had an ice drill about four inches in diameter, it was a simple auger as you would drill into wood, I mean it was much bigger than you would use to drill into wood. And so you wound it with a handle of a brace and pulled up the ice core and gently tapped it to fall out and then I think we were putting in the stakes probably at a depth of sixty, seventy centimetres to avoid them blowing away, so we thought they wouldn’t bend or break, and very straightforward and only take half an hour to put one up. Then you’d move on.

Thank you. And you then said that once you’d set out the line of stakes that as a group you measured the baseline. Could you describe that process in detail including the equipment you use?

Well, on all the other glaciers we measured a baseline on ice, but as I remember it the crevassing at the foot of Mount Hope was so bad that it was really dangerous to set up a baseline. So we had – I’d planned for this because having flown down the mountain range I knew the terrain and I could see that we couldn’t set out a conventional baseline so I had brought a subtense bar, I think it is, that you measure the… you set out a one or two metre thing on a tripod with accurate targets at either end and you measure the angle between the two and that, from that you can calculate the distance because that’s your fixed length and so you are starting from a very small baseline but a very accurate baseline and extending it by triangulation further. I mean that’s about the least accurate baseline that you can measure but it was the most accurate measurement that you could measure on a mountain where there was no flat area where you could with a tape measure set out a baseline. So it was a very short baseline survey but done very carefully and had to be stretched to intersect stakes ten miles away. But normally we measured a baseline on snow, 500 metres say, on snow.

Could you describe that process of measuring out a baseline on snow using a tape?

Yes, you started with a stake that you put up and then put up a stake at the far end of the baseline, then with a hundred metre tape, which had been calibrated by the National Physical Bureau in Washington, calibrated, I mean to better than a millimetre accuracy, and we would tension it with a spring balance to a certain tension and then read it off and initially put in a
matchstick and then move and move along and the matchstick served as start point for the next tape. The tape, as I remember, was a hundred metres tape, steel tape. And then we… so we had already set out the ends of the baseline so it was a matter of measuring exactly to the end. So then we had our baseline to do the triangulation from, but if it was on snow it was not where we could see the stakes across a glacier, so we then had to intersect two survey stations on the mountain in order to get the scale of the baseline on the mountain by triangulation. And from those stations we could see, intersect the stakes on the glacier.

Did it matter where the baseline was in relation to the line of stakes?

Perpendicular as far as possible.

[1:06:48]

Thank you. Was there any difficulty in resurveying stakes you’d set out the previous season?

Well, the ‘60/61 season was the first one we set ‘em out. It was the following season we had to resurvey them when they’d had a year to move and so the problem then was to find them because they had moved and one or two had broken off, but very few. And the most difficult was the Byrd Glacier because it’s so wide and there are so many shadows on it. We had painted the stakes in red stripes but we learned that as soon as you got more than a couple of miles away colour meant nothing. The shadow of the stake was the only thing which drew your attention while you were searching in the thirty powered telescope of the theodolite. It was the vertical line and the shadow on the shaded side that is what drew your attention to the fact that this is the stake that you put in. Otherwise all sorts of shadows of different shapes and sizes which meant nothing, except terrain.

[1:08:24]

So we did find them and the points on the drawing that you have there were all stakes that we re-found after a year and re-measured. And as you can see from the curve joining them, that they’re very convincing. I mean it’s a sort of profile of movement that you would expect in crossing a glacier, that at the edge you’ve got the friction of the rock sides and in the middle you expect it to move fastest, but as you can see, some of them are moving pretty well as a
block, on the Byrd Glacier for example, and the others had different kinds of profile. They were pretty narrow and so you were close to the edge of them anyway and so it was more like a smooth curve. But the Byrd and the Beardmore were moving pretty much as a block. In other words you had, after a couple of kilometres, you’ve got away from the friction of the margins and you were just freely flowing block of ice.

Did you find all of the stakes that you’d set out? In the third year, did you find all of the stakes you’d set out in the second?

Nearly all. The ones we… on the ice shelf, which again was an extra because we had to travel, when we were beyond helicopter range, we had to travel with the vehicles, I thought well, we might as well have fixed points out on the ice shelf to see how fast the ice shelf was moving. So we put up those and I used two inch diameter irrigation pipe for those and a few of them were broken off when we came back the next year, but we found most of the stubs sticking out of the snow and we didn’t expect this because we thought that they would be strong enough, but my guess was that it was, they’d started resonating with the wind and just fatigued themselves out in the high winds and snapped off. But we found the remains sticking out of the snow so we didn’t completely lose them. But three inch diameter and the four inch diameter ones we didn’t lose due to wind. No, but on Byrd Glacier we… I think we lost one or two, but there were still plenty left.

[1:11:37]

Now on this diagram which is reproduced as figure three in your paper, To the Valley Glaciers that Feed the Ross Ice Shelf [Geographical Journal, Vol.130, Part 1, 1954, p.32-48] the dots appear here at what looks like various distances from the side. So are they in the place where you found them? I wondered why those dots are in those particular places?

Ah, because we were not measuring except by eye the distance between them, we just wanted a series of points across. And near the edge we could set out a number without danger of falling into crevasses and that’s why there are several near the edges. And the ones in the middle on the Byrd were all put out by helicopter because the terrain was so rough and dangerous.
How accurate then are these spaces between the dots shown...

Well they’re all from the subsequent survey and so they should be accurate to a metre or two.

Can you say why you didn’t reproduce this diagram in your book, An Alien in Antarctica?

…Because the aim with all four of my books has been to describe what we were doing but only have a paragraph stating the scientific aim, because I wanted them to be available to a general reader and not confuse them with science or technology. But I always give the reference to the published paper where they can follow up if they want to and I use a superscript small number to refer to notes at the end of the books because the scientific way of referring to somebody else’s paper would be to say ‘Bloggs comma 1963’ and I thought for the general reader that’s annoying. What’s it mean? You don’t find that in a novel and so that’s why I put the inconspicuous superscript number so that it can be followed if anybody wants to follow it up, but is not interrupting the prose.

[1:14:26]

Speaking of the prose, were there any sort of literary influences on your books?

Well they must have been based on everything I’d ever read I suppose, as anybody’s writing would be, but I can’t remember anything. I had read the classics: Scott and Shackleton and Amundsen, because that was a simple matter of preparing for the terrain, knowing what to look out for and I knew that descriptions in plain English, all the Heroic Age explorers simply described what they did in plain English and that’s what I did.

Thank you. And on your diary writing?

Diary was again, to be the source of the book, daily diary reports. And a reminder of things which are not in the diary, because you can’t put everything in the diary. But it’s a wonderful way of jogging your memory and you can see even thirty, forty, fifty years afterwards, the diary quickly brought back the situation at the time, so I was able to describe it confidently.
When you were writing the diaries, did you at that stage, for example when you were writing the diaries from your American expeditions, did you imagine when you were writing them that you would at some point convert them into a published narrative?

I didn’t at the time, but as leader of the party I felt responsible for writing a diary and I think every leader of an exploring party feels the same, that you are the one responsible for bringing home the results and so it was a duty to write a diary.

[end of track 7]
Finish off on the second season.

Could I ask you about a particular individual who joined you at a certain stage on the second expedition with the Americans and that’s Brian Roberts. I wondered whether you…

No, he didn’t.

As a British observer?

Oh he was at McMurdo I think. He didn’t join my party at all.

But you mention him in the account of the second season and say that he worked at the Antarctic desk for the Foreign Office?

In the Foreign Office, yes.

Do you know anything about his work there?

A lot, because he’s had a biography written about him. He was our sole person in the Foreign Office dealing with the Antarctic because it was pretty insignificant until the International Geophysical Year when lots of nationalities sent expeditions. And of course very few ordinary diplomats knew about the situation of conflicting claims to sovereignty and stations owned by other countries, and some were scientific and some were political, and still are. He knew all that and he’d been a member of the British Graham Land Expedition so – 1934-37 – so that the concept of an icy continent was not strange to him as it is to many people who can’t imagine it. So it was the only position similar to diplomat in the Foreign Office that was not changing because you… it would take you years to get the background that you had if you had worked in the Antarctic. And so everybody else did a few years in one place and a few years in another subject and retrained to make a broad person, but he was the Antarctic desk and that was that. The present person running it is the Polar desk,
because we’ve got more activities in the Arctic these days, but still most of it is Antarctic. And because there wasn’t a great deal to do before 1957, before the Treaty, he was only half-time at the Foreign Office and the other half-time in the Scott Polar. And his great contribution to the Scott Polar was designing the library classification system. He chose the international Universal Decimal Classification and the breakdown of polar subjects had not been done. UDC is intended to cover the whole of knowledge, the first digit of a number being one to nine, and other fields such as history and science and literature had a good breakdown, their own design breakdown of their subject, but the polar regions probably started with Arctic and Antarctic and very little else because there were few people interested. And he realised that the polar regions are a coming thing and we’d better have a classification system to slot the literature in, other than just Canada, Soviet Union or Antarctic. And so his breakdown into smaller units of both regions and the type of science we do was submitted to the International something Federation that looks after UDC and they deliberated and argued and accepted it. And the Scott Polar [coughs] classification is accepted in all polar libraries, so we can easily exchange and understand what the classification is about. And he was very, very thorough and in training up cataloguers, and we still have half a dozen cataloguers in the Institute, he trained them not to write the catalogue card from the title, but to read enough to say what it was really about, and this is tremendous advantage in terms of deciding, the user deciding whether he wants to read it or not, because sometimes titles can be quite uninformative about the real substance of a paper. And so he was very, very fussy about that and he virtually ruled the successive librarians in the Institute with an iron fist and of course he was just a much respected person, he couldn’t legally overrule the librarian, but the librarian was submerged, drowned by Roberts’s arguments, he had very good arguments for everything.

[0:06:20]

*What was his role in work towards the Antarctic Treaty of 1959?*

He was the representative of the Foreign Office and therefore the only British representative. I think probably late on in the negotiations, which took months, I think they probably had the British Ambassador in Washington in to check that we were not proposing to give away too much. And of course the uniquely difficult thing about the British position was the disputed sovereignty in the Antarctic Peninsular and the fact that he wanted the present situation,
something more flexible where people could go wherever they wanted for good scientific reasons, versus what Argentina and Chile would have liked is to totally control who went to that bit of the Antarctic. And he won and we’ve been living with the happy results for half a century now and so he designed the thing to be very flexible and entirely based on scientists being free to do what they wanted.

[0:08:01]

*Did you notice any difference between going to the Antarctic for the Norwegian-British-Swedish Expedition before the Treaty and returning to the Antarctic for the Americans after the Treaty – did you notice any difference in the way that science could be conducted, for example?*

Not much. In terms of my own experience, the Norwegian-British-Swedish had taught me that nationality doesn’t matter and so I’ve never thought that it matters so I don’t ask where people come from, we’re all working together. And so the American system was very American and when I first went it was the year, ’59, that the Treaty was signed in Washington, so it didn’t come into effect, it wasn’t ratified until 1961 or ’62, so that really not much had changed, except that various countries had decided to invite observers from the other Treaty powers who were in all but name were inspectors, but in name they were exchange scientists. But they were obviously capable of reporting to their government if they found anything not in accordance with the Treaty. And that has been one of the great joys of working, that some of them have been simply observers and the first one, my friend Evteev, became KGB in the end, quite probably because he was fluent in English after being with the Americans. He may not have been before. On the other hand, he certainly would have been briefed before. And others were simply people who were honestly interested in the science that the other country was doing or wanted to take part in it. When I went to Vostok, the coldest place in the world, there was an American there who had his own very advanced programme of ionosphere sounding, so he was taking advantage of the position close to the geomagnetic pole and being exchange scientist at the same time.

*When was that?*

That was the same year I went with the Russians, ’64 winter.
Your friend, the Russian exchange scientist who was on the 1959-60 expedition, was he the first Russian exchange scientist who’d worked with the Americans or had there been others before?

Oh there had been others for a couple of years, yes.

Did you meet any other Russian exchange scientists…

Not then.

… on other seasons with the Americans?

No, not then but I met them later in conferences.

So apart from the presence on expeditions of observers from other countries, what other effect did the Treaty have once it was ratified in the early sixties?

It meant that in areas of disputed sovereignty we stopped shooting at each other because we’d agreed not to. We’d agreed that there would be no physical effort to assert sovereignty, because the great advantage of the Treaty is that it does not require abrogation of claims to sovereignty, but allows people to go anywhere without asking the claimant power. And that’s been its lasting joy, is that the claimant powers are still there.

And the Argentines at one station, Esperanza, which was originally a British station called Hope Bay and Esperanza is the same in Argentine, when tourists began coming there, they began asking the tourists for their passports and they wanted to stamp the passports. And of course most tourists want as many rubber stamps in their passport as they can get, so they gave it to them. But you only had to say no, according to the Treaty I don’t have to show my passport, and they had to accept that, which they did.
When you said that some stations in the Antarctic at the time were scientific and some were political, and then you said, and that’s still the case, could you expand on that a little more?

Yes. All the South American stations are political, with token scientists on, strictly token. The Argentines and the Chileans, they’re what I call research stations, are either run by the army, navy or air force, and that’s because they are competing for the government money, but it’s an extraordinary situation for a scientific base that in a scientific base you would expect to have the science deciding on the personnel, but they have these. I think they’re the only countries that do, although they would have pointed to the American base in the early years and said, well this is all US Navy, which it was. And the reason in all cases is that only the military had enough hardware – ships, aircraft, tractors – to put on an operation of that size. And in South America the three services are competing as they are here too, but competing quite brutally with each other to get the lion’s share of whatever the military wants. And that’s why they couldn’t agree on inter-service supported stations. They are one service only and they are there nominally for science, but actually for an expression of sovereignty, effective occupation before science, well in any claim to sovereignty, effective occupation is the most important criterion and so they are there for that reason. But since the Treaty, they think that was too blatant and so they do token science, but only token science.

Have you seen the science done, firsthand?

Yes. Gradually over the years it has become more serious and useful, but early on it was simply Stevenson’s Screen taking weather observations every three hours and sending it to the worldwide net by radio and that’s still done by of course the serious science stations as well as non-serious science. But that’s the easiest science to do, is weather reporting. So that’s why they all do it. But gradually over my time the South Americans have begun sending genuine biologists and genuine geologists, genuine glaciologists, to study the same sort of things that the rest of us study. And I think the military have always felt embarrassed that they were just military and they saw themselves as being an assertion of sovereignty, nothing else, they didn’t. Their governments pretended that they were scientific stations, still do, and so the amount of science slowly increased, but is still very, very little at the South American stations.
Would you still then describe them as political stations rather than scientific?

Yes.

When approximately did they start sending more real scientists?

Oh… it would be progressive over the last fifty years. Certainly more and more respectable ones instead of just students. And so they’re… occasionally some very good work. But it’s their government who said to the military you must take some scientists and make us look respectable.

[0:18:36]

How do you know that’s the case?

By talking to the military about it. I mean I still have a very good friend who is a general in the Chilean Air Force, Javier Lopetegui, he appears in Forty Years on Ice, and I used to argue with him about it and say that I would like to look forward to the day when all stations were scientific and not military and he got very upset by this remark. We’re still very good friends, but he said, well we just don’t have enough scientists to put up a decent programme in the Antarctic, the military are the only people who can do it. And he was right because you’ve got to have scientists of sufficient standing to command respect internationally and as I say, they gradually over half a century have improved that aspect, because their governments are obviously embarrassed by being teased about being military, being teased probably at scientific meetings, and quite rightly so. You see the Russians have always held their head high because they’ve never had military people, they’ve been civilians all along, because they have the Arctic and Antarctic Research Institute in Leningrad and so there’d been science on ice, on pack ice for example in the northern hemisphere, for many years, and so extending to the Antarctic was similar science and the same people. And so it was easy for them, they didn’t have to hide anything, and the Americans didn’t try to hide the fact that they were sending military there, but the military believed that they were there to support science and they were, except that in any military operation you are overmanned, you are necessarily overmanned because the argument in the military is that you may have people
killed but you must carry on fighting. So you never have the minimum number of people, whereas in a scientific station you do have the minimum number of people and that was illustrated on my first expedition. We didn’t have any spare men, but the military can’t re-adapt from the situation where they have redundancy until somebody is shot up and then the others have to take over. So that’s their mindset. And so they’ve always been overmanned and could do things with fewer people. And this applies as much to the Americans as much as the South Americans, they have more people than we would consider because military stations like the South American ones have a military rank structure and so the officers can’t be seen dead washing dishes at the end of a meal, that’s not for their rank. Whereas in British stations you jolly well do, everybody has to sweep the floor and wash up after a meal. And the Americans just have so many staff that you don’t in fact have to do anything except when you’re in the field away from McMurdo, you have to do everything. But at McMurdo we had no domestic duties, we were entirely preparing for our own project.

[0:23:03]

Given that McMurdo and the South American stations both were run as military or run by military authorities, what made the American station scientific compared to the South American stations?

That there were a number of scientists there, rather than very few. And there were always a number of scientists, they were always grossly outnumbered by US Navy and US Air Force, but I think the proportion was decided by the military, as I said, because they had this built-in redundancy in terms of rank and duties so that you were, you would carry on as an efficient unit when anybody had been killed. And that’s their mindset through all military services because that’s what they have to do, they have to carry on fighting. And even when they’re in a position where they’re not fighting, their rank structure requires that they have these specialist subordinates, one of whom is dishwashing. And they can’t work without that because they would be crossing boundaries of what they considered their job was.

What would, in the 1960s, what would the South American stations needed to have had to have been counted as proper scientific stations, or what would they have needed to have had more of?
Well it’s only behind their backs that we say they weren’t real scientific stations. What would they have to have done? Have a greater proportion of scientists. And to have the military really proving that they were there to support the science, whereas I have known Argentines and Chileans who say, well I’ve got a very good project but I really couldn’t get them to help me because the military’s duty, according to them, was to sit tight and keep the station and therefore any, such as a glaciologist who wanted to go away from the station, you were reduced to begging and you were begging of a military man who felt he was doing his duty by running the station, not by helping you to go into the field. That was the difference.

*And that view was coming from a South American scientist you knew, you were talking about?*

Yes.

*Were they armed, the…*

[0:26:27]

No, they weren’t armed, no. All Antarctic stations at the time had rifles for either killing seals for dog food or getting fresh meat for themselves. I mean there’s never been any shortage of fresh meat to be had, it’s become less and less fashionable because people are squeamish about wildlife, even when there’s plenty, because it’s not fashionable to kill. But that was the situation where people at the time didn’t think twice about killing anything. I mean it’s part of the culture in some countries and not in others.

[0:27:28]

*Thank you. Now on the third season, which was 1961-62, in the published book, An Alien in Antarctica, you for the first time start writing about thickness of the ice and this seems to be, this seems to come up for the first time then, on the ‘61/62 trip. Could you explain why you were interested in measuring the thickness of ice on that season?*

Because the real aim all along was to measure the volume of ice coming into the Ross Ice Shelf and for that you needed the surface velocity and the thickness and some theoretical
understanding of how the velocity would tail off as you got near the bottom, but we couldn’t measure, but there were various assumptions made. But that was why, to calculate the volume was the object of… and initially, ‘61/62 we had a gravity meter and ‘61/62 we had gravity meter and seismic sounding and that was the best, the seismic, it gives you much better, much more accurate depth. I mean the gravity involves a lot of assumptions about the density of the rock, which you can’t prove. So the seismic sounding is far more valuable.

*Can you remember what the assumptions were that you had to make of the gravity?*

Yes, what kind of rock there was on either side and underneath the glacier and you needed to know height above sea level because gravity tails off as you go higher. But it was… we were simply measuring the acceleration of gravity at the sampling stations. But that was interpreted when we got home by the people who were writing it up and they had to make assumptions of what kind of rock was underneath, particularly what density of rock I suppose.

[0:30:19]

*Why did you recruit Edward Thiel?*

Edward Thiel was an experienced geophysicist who had led parties in the International Geophysical Year – ‘57/58 – so he was one of the rare people in the early sixties who had a lot of experience and he’d done seismic sounding over many hundreds of miles in the Antarctic during the IGY and so he was the obvious person to come to do it. You see, we didn’t have any radar sounding in those days, seismic was the way and the Norwegian-British-Swedish Expedition had led the way in seismic sounding of ice and the IGY people from all nationalities used our work from that station to plan their own seismic work. And so I just needed somebody who knew what they were doing and somebody who brought the right equipment: explosives and ice drill and so on, and that there were very few experienced people around so I asked him to come.

[0:32:01]
Could you tell me what the output of his twelve-channel exploration seismograph looked like? He set it up and got it going and did something in the field, but what did the actual output of the piece of equipment look like – do you know?

Yes. I can show you diagrams of it. You’ve got these half a dozen, at least, microphones called seismometers which you bury in the snow and your trace comes out on a photographic piece of paper like a stationary seismic station where earthquakes wiggle the needle and what wiggles the needle in seismic sounding is the reflected echo from the bottom of the ice. And it’s where all six channels wiggle at the same moment that you realise there’s something reflecting and you’ve got to choose sometimes from a selection because you may be getting a reflection from a change in density of the ice and you may be getting a spurious reflection, so you have to make a choice as to what is a bottom echo. Now some is just noise due to vibration of the snow that you’ve set off during the one second that it takes to go to the bottom and up again, then there’s still shaking, so that you get spurious echoes and you have to distinguish.

How do you distinguish then, given that the wiggle on the chart that comes out could be a band of denser ice, it could be this noise by movement of snow that you said, a spurious reading. How do you distinguish therefore?

It’s difficult and there have been professional geophysicists who got the wrong answer. On Fuchs’ Trans-Antarctic Expedition there was a professional geophysicist who picked the wrong echo and got the wrong answer and it wasn’t till years later that people realised that his work was effectively nonsense; he’d failed to measure what we were looking for. And so interpretation of these wiggly records required great skill and that was an example where it all went wrong.

Did Edward Thiel talk about how he attempted to interpret the wiggles?

Yes, because he’d talked to Gordon Robin who was the pioneer and Robin, I don’t think we made any mistakes, but it wasn’t always easy to interpret the right reflection. And I’m sure they talked together. But you see the seismograph was something which was standard operating in oilfields to detect the strata in an oilfield and so Thiel’s training had been in a department that was very skilled at producing people to work in an oilfield with the seismic...
sounding and to interpret the results. And so he had, no doubt he had a lot of friends he could ask to help him interpret. And when the Russians, the Russians were very early doing seismic soundings and got very good results, but some dubious ones. And Gordon Robin, after the IGY, said we really must get together because we mustn’t go publishing things claiming they’re true when they’re not. So he convened a conference at which everybody brought their own records and compared them with each other and they could agree which ones were real and which were spurious, and this was a very good thing to do. So, because he was aware by then, Gordon Robin was aware that there were these claims, some of which were implausible, although even we, then we didn’t know, because we didn’t know much about the thickness of the ice sheet. But you needed to convince people that you had measured what you set out to measure and having a conference and seeing whether anybody thought you were imagining things from your own records was a very good thing to do. And so the whole science improved.

Did you go to that conference?

No.

[0:37:34]

Could you tell me how Edward Thiel used the seismograph in the field to measure the thickness of the particular glaciers that you’d look at the season, that you’d staked out the season before? In other words, what route did he take across, how many times did he use it?

Yeah. He didn’t have, he himself didn’t have time to do any before he was killed in a plane crash. We’d only just got started. So his assistants carried on and did alright, they got a number of plausible soundings. But at points in the season I left them behind because they were so incompetent in the practical aspects of doing the work and getting camped and next day getting loaded up again and getting on, so I didn’t take them on the southernmost part of our trip because they weren’t certain of their results, so I left them on the ice shelf to make different experiments to make sure that they were getting things. And in a footnote in Alien I point out that when they came back and showed their results to Crary in the National Science Foundation, who was a very experienced seismologist himself, that he said those are some of the best soundings that have been taken on the ice shelf. But they were, they needed days at
a site to make different experiments and be sure of what they were measuring and that’s why I left them, because we didn’t have days to spare. But what they did was perfectly alright. But they, I couldn’t let them loose by themselves because nobody, none of them had, none of the two of them had any experience of how to recognise a crevasse terrain and indeed one of my people did and it was the same in 1960/61, Arthur Rundle, once I wrote it up, we were in the middle of a ghastly crevassed area, crevasses every six feet, snow bridge, not all obvious, but it was obvious that we were in a very bad area. And he was a smoker and he was on skis but we stopped for some reason, discussing where to go, and to get a rest he got himself off his skis and started walking around within a few feet of his skis. But this was suicide and I remember shouting extremely loudly to him to stand still. He just did not realise that he was in a very dangerous area where you would not take off your skis.

[0:41:08]

What did the fact that Edward died and that the PhD students who were using the seismograph, you felt it was safer if they were left fixed in a certain place rather than coming with you, partly because you felt that they were quite slow at the actual being in the field. What did that mean for your attempt to measure the volume of ice flowing into the Ross Ice Shelf?

Well, we had done with the gravity meter, we had done, not the Byrd, but the Nimrod and the Beardmore and the Liv and the one further south, we didn’t have time, because there was a shortage of time, and so they were not, a decent cross-section was not done until 1967 when we had the Super Constellation four-engine airliner and got very good cross-sections of these glaciers by flying across with a radar and we learned then that the lower you flew the better the result. When we got to radar sounding in the Antarctic Peninsula we generally flew at thirty feet because it gave us better results. But we had to argue this with the physicist who said well, you know, there’s no significant loss of radio energy through air, only what you get in the ice, and so you can fly at any height you like and you’re not losing anything. But what we discovered was while you’re not losing any, interpreting the bottom echo depends on not having confusing other echoes there, and if you are in the focal point of a u-shape valley, you are getting reflections from the rock walls on the side and the bottom was just one of those. And so the… my technique was to fly as low as possible, then – flying down the
middle of the glacier – the nearest reflecting reflector was the bottom of the ice and not anything out to the side.

[0:44:09]

Thank you. Now you describe on this 1961/62 expedition yourself as a glaciologist, Arthur Rundle as a geographer and Edward Thiel as a geophysicist. Could you tell me what the difference was between those three scientific labels – glaciologist, geographer and geophysicist?

Geographer was in that case a polite name for field assistant, because he didn’t have any glaciology experience, he had a degree in geography as I had, but he didn’t have any glaciology experience so I thought it was the best way of describing him. Geophysicist had a PhD in seismology and so knew a lot about the theory and the practice. That was the difference.

I wondered at the time whether you could say more about the difference between being a glaciologist and being a geophysicist for people listening to the recording who won’t be familiar with either term.

Glaciologists are interested in all aspects. We needed to know, we wanted to know the density of the ice, we wanted as a contribution to general exploration of the area to measure the temperature of the ice because it reflects the climate year round, it smooths out the climate so you get a good measure of the mean annual temperature simply by drilling to ten metres and measuring the temperature at ten metres’ depth. So a glaciologist feels that he has to gather every bit of information he can, whereas the geophysicists were probably geologists in terms of first degree, but then had gone on to do, in the case of Thiel, a PhD in seismology. And that was the difference. But we were all, we were a team, looking at different aspects of the same project.

I wondered in other cases, leaving Thiel aside who did a PhD in seismology, what would other geophysicists have studied that marked them out as geophysicists rather than as glaciologists?
I think that they all needed instruments to discover anything, but perhaps that’s unkind because we all needed instruments, but they were the early days of what would later come to be called remote sensing. They couldn’t measure the thickness of the ice except by instruments, whereas measuring the temperature of the ice we drilled a hole by hand and put down an ordinary thermometer, which is an instrument, but ultra simple. I think a geophysicist needs more theory to interpret his observations because he has got to make sure with both seismic sounding and radar sounding that he is actually looking at the bottom of the ice.

Do you think it’s got anything to do with seeing things directly with your own eyes as opposed to seeing things as represented on some sort of trace that comes out of a…

Yes, I’m sure you have to be better trained than I was to interpret traces of things. I don’t think anybody ever questioned my results because they were straightforward rather than interpretation. Whereas the geophysicist needs interpretation, that’s the difference. But the more things have gone on in the fifty years since, we do more and more that needs interpretation, such as interpreting satellite images, which I’ve done a lot of. And so that remote sensing nowadays is the word and there are textbooks on remote sensing which include radar sounding, seismic sounding, gravity and so on and the theoretical basis for those techniques.

[0:49:53]

What was the, in terms of the wider interest in Antarctica, what was the reason for wanting to know the volume of ice flowing into the Ross Ice Shelf in terms of the wider context?

On valley glaciers in the northern hemisphere the normal primary objective is to see whether the accumulation of snow is exactly balanced by the movement of ice down the valley and the melting of ice down the valley because that is a steady state situation. And in terms of climate change, you’re going to have either accumulation or ablation, not balancing each other. And so that was absolutely routine with all glaciologists up to that time. So when we went to the Antarctic, we thought that’s the thing we want to do, we want to know whether the amount of snow falling on the continent was in balance with the amount breaking off at the edge in terms of icebergs. Well, it was absurdly presumptuous in the sixties to think that
we could get anywhere near that figure because we were measuring in a very small area and the Antarctic’s a very big place. And gradually other countries have taken similar measurements round and you’re gradually improving. But you can never say from our surface measurements whether the Antarctic ice sheet was in balance or not. The only thing which has allowed us to say that is satellites now can measure the height of the surface above sea level one year and come back the next year and measure the height of the ice sheet surface the next year and see if it’s either lowering or rising. And this of course when we began that, incredibly exciting, in Greenland it was first measured. But then there were several years of arguing about the accuracy and if your accuracy had been slightly different in your instruments two years running you could have an entirely false conclusion from it. So it took years to improve the accuracy to the point at which we were all convinced that they were able to measure within a few inches, the height of the surface, smoothed of course, averaged over an area, because your radar in a satellite is broad beam and therefore averaging over a large area. But if you use the same instrument two years running and follow exactly the same track, you should be able to show whether there’s a change.

[0:53:21]

_The interest in whether the continent was in balance then, I know you said it was very ambitious to think that you could decide whether it was or it wasn’t based on surface measurements, but the interest in whether it was in balance or not, what was the wider context of that interest? Was it just routine or was there…_

Climate change is always of interest to humans, but when you’re dealing with ice sheets, you are – because they are very large; Greenland and Antarctic – your changes are going to affect sea level, which are going to change sea level everywhere throughout the world and therefore are of interest not just round our own coastline, but specially Bangladesh where there’s lots of low-lying country. So that we always had this in the back of our minds that we wanted to know and if possible to predict changes in sea level.

_Did you have that in the backs of your mind then, in the early sixties?_

Yes, yes. Yeah, I was one of the first, I remember, to put in my publications that the Antarctic ice sheet was the principal control on world sea level. Up until then a lot of people
said well, it’s a long way away, it doesn’t affect our climate. Well of course it does because if you take ice off the continent, put it in the sea, you affect sea level, which spreads all over the world. And so I remember writing this and saying it in broadcasts and lectures and so on and people sort of starting, how can it be the principal control when it’s so far away. Well, it’s not difficult to explain.

*When was that, when were you first saying that and getting that reaction from people?*

I would think in the… in the late sixties I started saying that, probably.

*Did you feel yourself at the time that the arguments you were making were quite original in terms of the way climate change was then discussed, if at all?*

Well, it doesn’t take long with any new conclusion like that before people start saying, well it was obvious. And so my colleagues teased me with inventing *Swithinbank’s first law*, which is that all knowledge is obvious when you’ve found it out. And I think that sea level conclusion was a case in point, that once somebody said it, it is obvious. But it did need to be said, because that was the thing which connected Antarctic research with the rest of the world.

*Do you think that you might have been the first person to have written that or to have…*

Yes, but among glaciologists it was considered so obvious that it was hardly worth saying, but it needed saying. And I was the one who had to justify spending a lot of money in the Antarctic and I thought that was one of the best possible justifications for it, is being able to say what is happening to the ice sheet and its consequences on sea level. And we know now, even from only in the last ten years that it’s not as simple as that, that if you pour a lot of ice into the sea in the Antarctic, it doesn’t make a big difference close to the Antarctic because of gravity field all over the world. But one of the biggest changes would be up the east coast of the United States. Well it’s a lovely thing to be able to say to scare them, but I mean there has been a paper in the last few years showing isopleths of the change in sea level if you melted so much off the Antarctic.

[0:58:35]
Is that an argument you were making at the time in order to encourage the NSF to continue funding your work?

Yes.

Even in the early sixties you were using the climate change argument to…

Oh yes, yes.

… to make the case for future funding?

Well you see, climate change was one of the bases for the Norwegian-British-Swedish Expedition, whether the climate was changing. So it’s always been a good and a strong argument to use.

I wondered whether on the Norwegian-British-Swedish Expedition, was the interest in climate change there about climate change possibly being a worrying thing or was it just an interest in climate change?

No. No, it was interesting in terms of the change and whether the change, any changes that there were paralleled those in the northern hemisphere, because you’re dealing there with the fundamentals of climate change if it is happening at both ends of the world you must look to an extra terrestrial cause rather than just a regional cause, such as the movement of jet streams and weather patterns. And so it’s always been a point.

But by the early sixties when you were working with the Americans, you were explicitly thinking about this in terms of melting sea level rise, threat to populations on coasts?

Yeah, we were. Yeah.

Can you remember talking about it with other scientists?
Oh yes. But in terms of pointing out what was obvious once it had been said, we were needing all the arguments we could get for getting funds to continue work in the Antarctic again, so bureaucrats who judge the merits of your proposal, they want something that they can understand and they can easily understand the point about the sea level change.

[1:01:01]

I wondered whether you could now explain what a good gravity traverse involves, because in your book you say that at Liv Glacier you achieved the best gravity traverse of the season. Could you describe that process?

Well we were ski-ing, we had the gravity meter on our backs and we were ski-ing along the line of my ice movement stakes. And what made it the best, that we were on grounded ice and therefore not going up and down on the tide as we were on the Beardmore, and gravity measurements are very sensitive to height because gravity falls off with a gravity meter, you can measure the height of a table in a room between, difference between the floor and that three feet up and your gravitational field is less. And so it was very accurate instruments, these. And so tides, which we didn’t have time to stick around and study – other people did at other times – you could measure with the gravity meter hundreds of miles from the open sea. But Liv was aground and therefore not going up and down so it was not time sensitive. You could come there one day, you’d get the same result the next day. And so we had plenty of time, it was a glorious sunny day. We went across setting up the gravity meter – takes five or ten minutes to get it set up and settled down – but all it is in principle is a spring balance, but incredibly sensitive spring balance. And so if you use a spring balance to measure a weight here it’s going to be different to the top of the room. So it’s very height sensitive and so in a crossing like Liv where we had measured the vertical angles of my stakes, basically to help us find them later, because they’re tiny things in the telescope when they’re miles away, they… we knew the height and that’s the correction that you have to do in a gravity measurement, but relative height in that case. And so we knew how much of the gravity field was affected by the surface height and the other part was affected by assumptions about the density of the rock and the density of the ice. Well, our assumptions about the density of the ice were pretty good. And you had to make an assumption about the density of the rock and most of the geophysicists had a degree in geology and so they made their own interpretation from what they could see of what the rock continued under the ice. I mean you could see the
walls and make reasonable assumptions about what they were, but underneath the glacier you
had not a clue and had to make an assumption. So all gravity measurements were height
critical and geology critical and the only thing you could be certain of is the average density
of the ice. And so it’s not a direct way of measuring the thickness of the ice, involves a lot of
assumptions, but before we had seismic equipment it was the only way we had.

[1:05:48]

How does it give you a reading of depth? So to start with, what does the reading look like?

Well as I say, it’s a spring balance with a very, very accurate microscope looking at how far
it’s stretched. You start with the rock, on rock. So you know at the side of the glacier what
the gravity field is when you’re not on ice at all. And then going on to the ice at known
heights relative to this base station on the rock, you can compensate for that height difference
and you have to assume that the gravity due to rock type at the edge is the same as the rock
type underneath. You have to make that assumption. And so you can correct for the height
above the surface quite easily and then the difference in gravity beyond what is due to the
height above the surface above the base station on the rock is due to a change in gravity
which you can interpret as change in ice thickness. Now, while I was with the Russians in
the Antarctic my colleagues published a paper in the *Journal of Glaciology* on cross-sections
of those glaciers based entirely on the gravity and it’s interesting comparing it with the
results from later in that they weren’t bad, I mean they were within about plus or minus ten
per cent of the two thicknesses. So it was an approximation and the best you could do at the
time.

*So the output is really a number, you look through the microscope and see how much it’s
stretched in scale and then...*

Yeah. And you have to compensate for the fact that as with all spring balances with a weight
on the end, the spring balance is stretching in a small way every day, every hour, so the time
of taking the observation was critical. And so having measured base station on rock then
crossed, you come back, re-measure the base station and you find it’s changed and that is due
to stretching of the spring balance.
Now, on this trip you noticed, or you came across cairns that had been left by members of previous expeditions?

Only Amundsen… Amundsen and the first Byrd expedition, yes, that’s true. They were a hundred yards apart and the Byrd people had gone there because they’d read Amundsen and were curious about it. But also had very good reason to dump all their things they didn’t need for their 500 mile dog sled journey back to the coast, and so they dumped a radio, as I’ve dumped radios since because a radio is very heavy and didn’t work, and they dumped a broken sledge, they dumped some clothing because of course on the ice shelf it was warmer than higher up. Amundsen only dumped – well we only found – five gallons of kerosene that he’d left in the can, which was his reserve supply of fuel for his primus stoves. He’d been travelling – I mean you have to estimate what you’re going to use and he – and you always want to have spare because you don’t know how cold the weather is going to be, particularly on the high plateau, and how much you will need to melt your food. So at this point, having got down to the coast, to sea level, he had five gallons spare and he put it in this can and we found it there. We didn’t touch it because it was nice to know that it was reserve for anybody in distress. But the Americans had found it in 1930 and similarly noted it in, I think, I can’t remember, but I think they removed a rock or two to see it and then they were concerned with dumping a lot of their material which we, all of which we found. And that included Gould’s geological hammer, because a geological hammer is no use once you leave the rock, but it’s very [coughs] precious for a geologist, his hammer, it’s his primary instrument of sampling. And so that’s why it occurred to me that he would like to have it back after all those years and that’s why I picked it up and sent it to him. Well, since then the importance of this site has been recognised by the Treaty and declared a site of special historical interest and so it’s illegal to take anything from it now, but this is really to prevent people taking souvenirs. There was nothing that I took that I haven’t published as having been taken and Gould’s note, I think I still have it. But again, I published the fact that I took it and published the wording of it, and the same as Amundsen’s. I made my own translation of Amundsen’s because Gould had had somebody who knew Norwegian but didn’t know the terrain, make a translation into English of it and I thought I could improve on it, because knowing Norwegian, but knowing with hindsight what the mountain range looked like; Amundsen had speculated that it went on and on. We now know it does and in terms of colloquial
Norwegian, I was pretty fluent in it so I published a slightly improved translation of the Norwegian.

[1:13:59]

*What did Gould say when you sent his hammer back, what did he write in his letter?*

He was absolutely thrilled. I’ve probably got it somewhere, I’m sure I have. Absolutely thrilled and tickled really, because you can always buy another hammer, but to have your own is something that geologists love, he has his favourite hammer. And the other thing I rescued was a tin of, one pound tin of Quaker oats, label in very good condition. And he didn’t ask for that, but his wife wrote to me privately and said could she have it and she’d give it to him as a birthday surprise, which she did. So by correspondence we struck up a good relationship and then Gould was invited to open the new building at the Scott Polar paid for by the Ford Foundation, of which he was one of the trustees at the time. And so that was the first time I met him and we had this in common that we had corresponded, so that was a very happy day.

*My reason for asking is partly to ask whether you ever left any traces, any of these kind of, yeah, deliberate sort of traces of you having been in the landscape. I know you left poles, stakes that you could re-measure them the next year, and presumably they ended up in the sea eventually, but did you ever leave any sort of permanent or semi-permanent mark?*

No. Geologists as they are climbing over rock usually do pile a few rocks up as you would, people do in the Lake District to show they’ve been to the top and sometimes put a note in, but I was working entirely on ice and therefore didn’t. But we found another record at a place called Durham Point on the Scott Glacier that we knew from reading the account of the Byrd party that went there that they had been to this. And I was looking for a potential survey station, in other words something high that you could see over the glacier, so we visited this and as we approached we saw there was a cairn and I don’t think I… I think it was Tom Taylor and Arthur Rundle probably were the ones who went there, I didn’t actually go to that cairn, but they photographed it. I was busy scouting out a better station higher up the glacier, which we found.

[end of track 8]
Could I ask you to tell me what you can remember of the nuclear power station which was being built at McMurdo base?

Well the idea was to save a great deal of fuel, I mean the American buildings, of which there were very many, are all [coughs] heated to American standards and in coming indoors most of the navy people strip down to a t-shirt, because there’s heat in the room, which is very characteristic of all American houses; private houses as well have them overheated, there was no thought of economy. And so they were consuming thousands of barrels of fuel every year and so there was the delightful idea that if you could make it all nuclear you’d save vast amounts of fuel and when they built this thing it did and it condensed… evaporated seawater to make freshwater, because it had so much spare heat, produced all the power, but because it had to be ready to be shut down at a moment’s notice if there was any leak of radiation or something, it was not considered a hundred per cent reliable and therefore the diesel power station had to be kept fuelled up and ready to cut in if the nuclear failed. But there was no doubt there was a great saving of oil fuel compared with the amount they were using before, but in the end after so many years – a few years, I forget which year – some years of the Antarctic Treaty, people kept on saying, oh I thought we had the Antarctic Treaty and no nuclear, and the Americans could correctly reply, no, we signed the Treaty meaning no nuclear weapons, there’s nothing to stop us having a nuclear power station. But they were made to feel more uncomfortable over the years as more people said oh, I thought we were a nuclear-free zone. And also it was unreliable because the pipes corroded, the seawater pipes corroded. Any desalination plant in the world, and most of them are in Saudi Arabia driven by oil, they all last less long than their design life because saltwater, heated saltwater is very corrosive. And so this one starting having problems and every time it had to shut down, because you can’t take any risk of spreading radioactivity, the diesels had to start up again, so eventually they decided take it out. But amusing little by-product of that, everyone’s very sensitive of not leaving any radioactivity in the Antarctic, so they took the whole thing out and then discovered the rock into which it had been let down was radioactive, so they started scraping away at the rock. And they scraped it, scraped thousands of tons off the side and then realised that this was a naturally radioactive rock and they shipped out all this thousands of tons of rock out of the Antarctic unnecessarily because they were so determined not to be accused of leaving any radioactive trace.
When was it closed?

I forget which year, but it would have been in the late sixties probably.

[0:04:30]

Thank you. Can you remember how you corresponded with home on this 1961/62 American expedition?

Only by letters and we were too busy to write much, but I did. But you see when we’re in the field, which is what I wanted to be all the time, there was no way of getting a letter out and so I didn’t. But my dear wife kept on writing and occasionally we had air drops from aircraft flying over with mail, which was very welcome. And she must have felt pretty deprived in not getting an answer, but I think she knew that we couldn’t in the circumstances, but we were all delighted to get mail dropped to us by passing air. The Americans are very, very generous about that. They would have a flight out at Christmas and they would drop a bottle of whisky wrapped up in scrunched paper or something so it didn’t smash, and Christmas pudding and turkey and all, they were very nice about that. At terrific expense, because they were a special Christmas flight. And it was very nice. But no, it was not until… the first radio communication I had was one day I was at the South Pole, I forget which time that was, quite probably not until I spent a month based on the South Pole in ‘88/89, I phoned up my wife. And these things were ‘patched’ as they say, through the normal telephone system from an amateur radio – amateurs enjoyed doing this – in Texas, this particular one. And so they transmitted to him and he then rang on the telephone system reversing charges so that my wife got a phone call saying will you accept a reverse charge call from somewhere in Texas and she said well, ‘Who is it?’, and they said, ‘It’s your husband’. [laughing] And she thought well, he’s supposed to be in the South Pole. I had to explain that.

[0:07:24]

Can you remember the sorts of things your wife wrote to you on the ’61/62...
Oh, what was happening in the family, that’s all, just family news. That’s normal family news.

*What was happening in the family at home at that time or around that time?*

Well, we had these three – no, we had two children during the American – and so we had my daughter who’s the surviving one, who lives thirty miles from here. And so they were… they were… going to school, and so normal sort of school news was what I got and news of my mother, because my mother was always too busy to write letters so my wife wrote about what she was doing. But nothing special.

*Did your wife then become friends with your, or friendly with your mother?*

Yes, she was always very friendly with my mother, yes. I mean my wife was a very friendly sort of person, she made friends with everybody and so she was a good friend of my mother and my mother occasionally went down and helped on the farm. And specially with the girls, they loved going on the farm and helping. So during school holidays they all went down there.

[0:09:06]

*When you left for the 1960 expedition, as far as I’m getting things right, you’d just married and you had the one step-child, and when was your second child born?*

Second child was born just after I left to go with the Russians in January 1964.

*Oh, okay. So at this time in 1961/62, you’d just got the one child at home with your…*

The two girls, the step-daughter and Carol. Carol was born in Ann Arbor, Michigan. She was our first child that we produced.

*Oh when was she born?*

In… third of December 1962.
Okay. So that was while you were…

At Michigan, yeah.

That was while you were out on this third…

No. [pause] No, I was… why was I there on the third of December? I was there when she was born. I’m struggling to think why I wasn’t in the Antarctic.

Could it have been ’63?

It could have been. Yeah, must, it must have been ’63 because then I was, yeah, then I was in Ann Arbor, yes.

Okay, well if we could then talk about ending the third season with the Americans, coming home from that trip. Could you tell me then about the birth of your first – your first child, but yours and your wife’s second child?

Yeah. That was third of December. It must have been ’62, because that was… I was not going to the Antarctic that season, ‘62/63.

Okay, yeah.

And so I was there and she was born in a hospital and that was all very happy, and came home a day later.

[0:11:40]

Were you there for the birth?

No, I was very annoyed because I wanted to and they… it was not conventional, but when she was giving birth my wife said, well I would love to have my husband here, and they said oh, we would have been quite happy, but they were too busy delivering to go and get me, I
was waiting outside. And she would have been happy to see me, to witness it, and I would have loved it too, hold her hands. But no, so the baby was a couple of hours old probably, when I first saw it.

*And what did you name your second child then?*

Carol. And the story behind that, and that is this American habit of naming children after their parents, which I think is uncivilised because you don’t know who’s talking about who, which generation you’re talking about and that’s why they have this ‘Junior’ business and Charles Swithinbank III and things like that. Well, she was brought up in that culture and wanted, if it had been a boy, she wanted to call it Charles and I said no, no, no, I’m afraid that’s just too silly for words. And she said well, the female version of Charles is Carol, and we’ve produced a girl, so can we call it Carol, and I said yes, we can.

[0:13:23]

*Did you have to move now that your family was getting bigger in Michigan or…*

Yes we did, we bought a house. We bought a house. And it was a lovely little bungalow. All American houses have basements, so it was bungalow but it had a basement. Three bedrooms I think, and very nice with lawn going straight on to the street. In fact in the area all lawns went straight on to the street and that’s why my lawn goes straight on to the street, without a fence. Yes, it was very happy, happy time because I was in the evenings learning to fly at the local airport, it was only a mile away, and I had permanently booked the five thirty slot for a lesson, so I left the office and drove straight to the airport and had my one hour lesson and then came home. And it only took forty days to get my forty hours of flying and my licence.

*What did you do when you got home from your flying lessons, arrived back home?*

I arrived back home and it was suppertime by then and so I played with my children. It was a great advantage having this enormous gap between daughters because the elder daughter, Ann, could do a lot of looking after her young sister and while my wife was cooking supper we had somebody there to look after the second child.
Can you remember the sorts of things you did with them, the sorts of games you played, things you read to them, that sort of thing?

I read to them. I do remember reading. I can’t remember games, but reading I always enjoyed doing, yes.

Can you remember what stories you read to them?

No.

[0:15:48]

And do you remember any sort of family outings at this time?

Yes, we would go on outings, but generally with a very young child we wouldn’t. We did take Carol flying at age three weeks, so she had an early introduction to flying, in the back seat of the plane. But the most memorable occasion of flying was when I had been… got qualified at night, which is sort of extra to your licence, and on the fourth of July firework night I booked the aeroplane. Well the airport was closed and everything and I arranged it with the owner of the aeroplane and he said, well the key of the aircraft is under the doormat. And so we went down there, airport totally deserted, and got in this aeroplane and flew it over the fireworks and that was a very great thrill of course, because all our friends were on the ground thinking that we’re going to get shot down, because they couldn’t tell how much higher than the fireworks we were, the rockets all going up. In fact I think I was at least a thousand feet above the highest rocket because I didn’t want to get shot down. And that was fun, we just stayed up there going round in circles watching all these fireworks. And then the most exciting thing was when the fireworks finished, everybody on the ground got in their cars to drive home and there was colossal traffic jam as they were all driving home. And so we were flying over these traffic jams and just went three minutes back to the airport, landed. [laughs]

Who was in the plane for that flight, which sounds brilliant?
I think all of us: wife and two children, yes.

_Could they – I’m not really sure about the... I’ve never been inside a plane of that size - can the children, could they look out of the windows?_

Oh yes.

_Yeah? And see all the..._

Everybody had a window, yes.

_Gosh, what a wonderful view._

Yes, so we all enjoyed it very much.

[0:18:32]

_Thank you. And your work at this time – you’d come back from the three seasons, were you planning at that point to stay another, to go out another season with the Americans?_

Yes, I was. We were planning to cross the Ross Ice Shelf and do what we didn’t do the first season accurately enough to get a reasonable answer, the rate of movement of the ice shelf, and we had invited a German group of professional surveyors who had these latest gadgets called tellurometers and they brought with them... I mean work at that time was pretty international and the National Science Foundation didn’t worry whether I had Germans come or anywhere else. I think they were probably rather pleased to have the Germans because they didn’t have to pay for them. And so we had a very strong team and I was going along, but when this Russian thing came up I... decided I wouldn’t go and would prepare to return to England and then go with the Russians. You see I’d been trying for five years, correspondence, to go with the Russians. The whole time I was in the States I was corresponding, trying to do it and corresponding with Soviet glaciologists who I had met in conferences, and of course in international conferences everybody’s very friendly. But it had to be cleared with employers and the Soviet Academy of Sciences and everything in the Soviet Union had to go through channels; political channels and a lot of stuffy academicians,
whereas in England the only problem was to find somebody who would pay a salary while I was absent for eighteen months. And there was a bit of problem with that because the Director of the British Antarctic Survey, Sir Vivian Fuchs, perhaps understandably said no, we haven’t had him work for us, he’s been working for other people all his life, why should I pay him for not working for us. But then I brought pressure to bear from any contacts I could find and eventually he gave in. But I couldn’t go for nothing, I mean unmarried I would have gone for nothing, but married I needed a salary. And so the arrangement was that BAS would pay money to the Scott Polar and I would be legally employed by the Scott Polar, and then again Gordon Robin, Director of the Scott Polar, didn’t want to be left out of pocket so to speak, so he said to me, I’ll support this if you agree to come back and work for the Scott Polar when you’ve been with the Russians. And I agreed to that, and did for years afterwards. And so that was fine. So salary was organised, wife was pregnant and that was a difficulty and I wouldn’t have gone if she hadn’t supported me. She always supported me to get on with my work. And so she was only a few months pregnant and she was happy that I went. I was not happy, but having struggled five years to make this arrangement, going with the Russians, I felt I ought to take it, so I did. And that was fine, but the son was born prematurely in January ’64, not much more than a month after I left home.

When did you find out that your son had been born?

Well, straight away in a telegram, but nobody told me that he was Down’s syndrome, handicapped, for quite a time after that because they didn’t want to spill the beans over the radio when everybody would have known about it, because there was nothing private in the radio. So I was beyond the reach of mail by then, so the first I really knew about it was a year later when the mail came down on the ship, Russian ship, after my winter there. And as I’ve told you before, everything was understated in our communications with each other, so I mean she told me and explained what it meant to have a Down’s syndrome son and…

[telephone ringing]

[end of track 9]
And so the first time that you learnt of this, in the letter, can you remember what the letter...

Well, it was the first when the mail came with the ship which was coming to pick us up after our year at Novolazarevskaya, the station. I didn’t... we all were loaded with mail that arrived, and so we spent all night reading our mail, but I didn’t share this with anybody because it was strictly a family thing. And I immediately in my next monthly telegram conveyed my support. I said okay, we’re going to look after him. And so he... when I got back home, my wife said well, it’s best as he’s not had a father up till then, that you ignore him, that is, pretend you haven’t noticed him so that his home life continues as it was until he gets used to you and then you become a normal parent in sharing everything. And this worked very well, it was very sensible thing to do. And we were then within a few months invited by a paediatrician in Addenbrooke’s Hospital, Cambridge, in to talk about his future and she sat us down and very glumly said that I’m afraid I have to tell you the truth about this and this is that your son, life expectancy is perhaps ten years. Well, we all said okay, well we’ll give him a good life for his ten years or whatever. But last Saturday, two days ago, was his forty-sixth birthday!

Oh, fantastic.

Which I attended at the group home where he lives in Cambridge. So that was the life expectancy at that time because up until then the tendency had been to put away Down’s Syndrome in homes with no stimulation at all and no education, just sort of housing them. And of course they died young through sheer boredom and lack of stimulation and it’s not just our son, but the average age of dying now is, I don’t know, fifty-ish or something, of Down’s Syndrome, so it’s completely changed in a generation. And so we lived through that and we did, we got him into a boarding school and he had a marvellous ten years in a boarding school and I should think the best years of his life probably. But my wife took a tremendous amount of trouble to organise this and to get the government to pay for it, because that’s what they’re required to do, they do everything possible to wriggle out of paying for boarding school and in fact in Cambridge it might not happen today at all, but with the help of medical consultants who were friends at the same time, this was organised. And so the whole ten years, he had all his fees paid by the taxpayer. Wonderful. And then
the procedure was to come home to get reacquainted with your parents, but of course every school holiday we had with him anyway, and then he was expected to start on whatever job he was capable of doing. And he still works two days a week in a restaurant and the only reason he doesn’t work more than two days a week, he’d be quite capable of, is that there’s a limit you can earn without having your benefits reduced. Well that would be alright in theory if when you stop working they recovered the benefits, but even the benefits people say no, don’t rely on that because it’ll be hell of a job to get them started again. We will let him earn fifteen pounds a week or something, from his two days, and that’s the maximum he can earn without declaring it and having it docked off his support. And so that’s the way it’s been. I mean I feel embarrassed because he could have earned more and had it knocked off what the taxpayer was paying, but the taxpayers’ representatives advised us against that.

[0:06:10]

_Can I take you back now to first receiving the letter from your wife explaining that your son had been born early, and can you sort of put yourself back in those shoes and remember how you felt then about receiving what you seemed to be suggesting was a sort of partial account of what was going on, or an account that was sort of not…_

Well, I don’t think I was given an inkling in the radio, monthly radio letters we exchanged. I think she said he was, said he was underweight, but she didn’t want to… I mean she didn’t know, well nobody knew at that time what you were in for if you had a Down’s syndrome child. Of course being at home she could have plenty of consultants to tell her, so that’s why she didn’t want to shock me with this news until she could write it longhand in a letter, which she did a year later, well it arrived a year later. And I think that was probably a sensible way to handle it.

_And in the letter though, do you remember reading the letter and how you felt and what you thought then?

Oh total acceptance as you do if you take on a family, you accept what happens to them. And so there was nothing to say really, except okay, we’ll do our best, which we’ve been doing ever since.
When you returned home then from the American, the third American trip and you were working in England, presumably writing up the results of your American expeditions…

[both speaking together]

I was still writing up results, yes.

[0:08:27]

…in the University of Michigan. Can you tell me about your decision to – which you must have made earlier looking at these dates – to decide that you wanted to go on this Russian exchange, you said that you’d been corresponding for five years in order to bring it about. Why did you want to be an exchange scientist on a Russian expedition?

Because more glaciological literature was coming out, being published in Russian than the rest of the world put together. That’s a pretty sweeping statement, but probably roughly true. They had a lot of glaciologists employed because they had their drifting stations on ice floes in the Arctic Ocean, they had a lot of glaciers supplying water to settlements and therefore whether the glaciers were in balance or retreating was very much a concern to them. So they had a lot of glaciologists and they were publishing a lot and we were ignoring it because we couldn’t be bothered to read Russian. And I felt very bad about this, specially as I’d met some of them in conferences and knew that they were very competent people, and I couldn’t face… and one of my Canadian colleagues went to the US army school of languages in Monterey, California and had an eighteen months crammed course in Russian because she felt she needed it too.

[0:10:12]

And I couldn’t face grammar books, I always hated grammar books, but I’d been very quick to pick up a language by living it, speaking it, as you learn your own language without reading, long before you could read or write you were fluent in your own language. And so I knew I could do it, having learnt Norwegian and Swedish, a mixture between the two, and become completely fluent in those, but then that was three, nearly three and a half years of total immersion and speaking it, and so I knew I could do Russian and I couldn’t at that age, in my thirties, face grammar books. I tried, but my wife and elder daughter had things called flashcards, which is a Russian word on one side and the English translation on the other and
after it was decided that I was going with the Russians I wanted a crash course in Russian and they would show me these cards in Russian and have me translate, to learn. And after about ten of them I felt so soporific I’d go to sleep, because it was so boring, learning that way. But I had probably learned 500 words by the time I left and so had some idea of what was going on. And on the ship on the way down I had lessons from a Russian who was a meteorologist and gave me lessons in pronunciation and words. And so I was improving the whole time and then living with people who were speaking it the whole time and probably spoke slower when they were speaking to me, I quickly expanded my vocabulary and living with them, you have all the non-verbal cues as to what you’re supposed to be doing, the eyes and everything else conveying things. So we didn’t have difficulty. I remember very few occasions when I said I haven’t a clue what you’re talking about. I wouldn’t have put it as bluntly as that. But I was very quickly learning what I needed to know and I was already conversing on the ship, on the second ship, the Ob, with people in a pretty sort of stilted way, but also the ones who knew English invited me and they wanted to practise their English, so that there was a bit of English as well. And at the same time I was reading a Russian grammar book, which I still have on the shelf somewhere, trying to get a little handle on elementary grammar. But never did get very far, but the main learning of Russian was exactly as a child, by repeating sounds in context. You learn the meaning of words in context that you hear, and then when you begin to use them, you use them in context and the case of Russian which is not simple at all, they learn in context, and I learned in context simply by where a word or series of words was used. And… but it took me a whole year and a half in order to have sensible conversations about abstract subjects. Practical subjects were easy. They would be asking me to do something and I could understand that.

[0:15:12]

As soon as we got to the Antarctic I realised that they were short of tractor drivers so I volunteered to drive a tractor and did, and of course not many people had driving licences in the Soviet Union at the time so it was great advantage being an experienced driver. And so they immediately put me into a tractor weighing thirteen tons, checked me out on how to change gears, and then sent me back and forth to the ship with an enormous sledge behind carrying, well carrying from the ship to the shore twenty-five tons of fuel drums. And this on sea ice which was rotten and rotting further, so it was quite frightening. But there were several other… several Russians doing it. And I had seen a film, a Russian film years earlier of one of these tractors going through the ice and sinking straight out of sight with the driver, and I had this vision all the time. But that driver had a cab on his tractor and that’s why he
was pulled down. I didn’t have a cab and so I was always prepared to jump off if I could get away with jumping off. But it was quite frightening because there was, beneath the snow on the surface there was a layer of water, perhaps a foot of water or more, and then another layer of solid ice and so you’d feel yourself falling, but then you’d stop after a foot and you’d be splashing through water. You didn’t know whether the ice underneath would support you or not, it was very, very scary, but I had let myself in for it, I’d volunteered and so I got on with it. And they were very, very friendly and sometimes we got stuck, sometimes somebody else got stuck and we had to unhitch our sledges and two of us haul on one sledge. Well that was, you didn’t need language to do that, it was all obvious and the wonderful thing about the Russians was there was always more laughs than tears and they had a hard life and they were used to taking it in their stride, so we had lots of laughs and wonderful mutual help. And I think I gained a few brownie points by doing that. I mean my colleagues destined for Novolazarevskaya were navvies loading and unloading the drums on the sledges, where I was in a privileged position of just driving. But that’s the way it worked out and everybody was very happy.

So I was learning Russian rapidly, so by the time I came home I was able to read the Russian literature. But when I came to read it, I realised that it was not in some respects up to Western glaciological literature, although they had far more published literature, they were interested in churning it out and there was far too much data, far too few conclusions in it. So I lost, well I never told anybody this, but I lost my potential respect for a lot of Russian literature. But at the same time, they had a very distinguished glaciologist called Shumsky who was with us the first season, and professor in Moscow University, and he’d written a textbook of glaciology which the Americans pounced on and had translated and published in English, because it was ahead of what anybody in the West was thinking. And they later published several books, they published the history books of the Soviet expedition in English, so I have them in Russian and English.

But that’s why I wanted to learn Russian and what was embarrassing was that I couldn’t find out what work I was going to be able to do in the Antarctic because they wouldn’t write letters, letters compromising on the Soviet regime, they all have to be, go through the censor. And so I asked every question I could think of and didn’t get answers. And so I was just taking the pure risk that I could be useful, and in fact when I got down there I had to decide what to do and luckily found enough to do to be useful and did a lot, the same as I’d done.
with the Americans, a lot of ice movement measurements, but not enough at the end of the twelve months to really be worth publishing as a stand-alone paper, so I prepared all the results for Russians to understand and my roommate - I wrote in English – my roommate was the only person on the station fluent in English, he translated all my work into Russian. And this was given to Russians coming the following year who, as there were two of them, did get enough to publish and they added my work to theirs and published it in Russian. So it was acknowledged as being my work, so my work was published but not under my name.

[0:22:07]

And in the five years that you were trying to get this position with the Russians, you’ve explained the obstacles that had to be overcome in England regarding the salary and SPRI and BAS, what do you think that the obstacles were on the Russian side?

Much bigger than in England in that everything in Russia was decided from the top down, so that the idea of somebody working from the bottom upwards was absolutely unheard of in Soviet Union, you did what you were told to do and all programmes were decided from above. But having been with the Americans and following my own proposals, that was the way I was used to it. And so I wrote first to the nice Russians, including Shumsky that I’d met in conferences and he was fluent in English, but he dare not reply or take action on the basis of what I’d written to him, it was just not worth his position in the Soviet Union, I mean that’s the way it was. So he wrote bland answers saying I’m doing my best, or something. And so I wrote to the Soviet Academy of Sciences, I wrote to individuals saying the same thing and it was five years from the first effort, which included the whole three years I was in the States, until I’d finally beaten them down by being persistent. They agreed, but then I had this slight problem that I needed a salary while I was… I had to organise that as well and so before getting the Russian permission I was working on the salary aspect in the hope that the Russians would come through. And so I won and that’s why I put, in the book I put that as an epilogue because it’s deadly dull reading it, simply says who I was corresponding with and it’s nothing to do with the adventure in the Antarctic.

And what do you think was the influence of having worked for the Americans for three years on your application, while you were applying? Do you think that had any influence on your success or lack of success…
It… I don’t know whether it did or not, I rather doubt it. You see, while I was in the States I had said well, you’re always searching for exchange scientists to go with the Russians, here I am wanting to go. And I realised that they couldn’t really because that was to be an official government to government arrangement and they couldn’t have somebody with a British passport being passed off as American, it would seem very strange, and the Americans saw that and said no, we really can’t try that one. So I said okay, well I’ll pursue it through the British, which I did. But by that time Gordon Robin was working on my behalf by corresponding with the Royal Society and I think he’d made up his mind that if I got a salary I would be a useful person to have in the Scott Polar after I came back, and that’s why he was helping. But still, we were old friends from the Norwegian-British-Swedish Expedition. And I mean I could correspond direct with the Royal Society in London, they at least answered letters and explained what the problems were. But the Russians we simply wore down over the years, they’d been written to by the Royal Society in London and scientific exchanges, exchanges of scientists were more and more popular and smiled on as being a good thing for political as well as scientific reasons. And so I just gradually wore them down until the Russians gave way and only about a month before I went they said you must appear at Le Havre on the third of December 1963, and I went not knowing what I was in for, with American Antarctic clothing, a few books, and really being very much in the dark.

But they were very friendly from the start because I think they said to themselves, well, we assume that these exchange people are all spies, but there’s no reason to be unfriendly because you think he’s a spy, got to live with him. So they were very friendly and very easy to live with all the time, there was never any difficulty about being a foreigner. They would tease me, didn’t mind that.

Why did you decide to move from America back to Cambridge?

Simply because the Russian exchange looked more and more likely.

And you, can you say a bit more about why that made you move back to Cambridge? Was it necessary?
Yes, it was necessary.

In order to... carry on applying?

Or in order to be sponsored by the British Antarctic Survey. It wouldn’t have done, sounded good to come from America and by that time it was clear that Gordon Robin wanted to employ me when I came back and that was wonderful because otherwise I would have been in the lurch and with a family I had to have a salary.

Where did you live in Cambridge when you moved back there?

In this house. I built this house as a bachelor before I ever married.

Oh.

I thought I’d got things in very logical order. When I came back from Maudheim I bought a car, cost me one year’s salary, £400, brand new. And then after my year in Sweden I came back to work in the Scott Polar on the Northwest Passage project and found that renting was expensive, whereas old housing was cheap and I had always kept a reasonable bank balance and when this house came up – this is two houses put together – one was £600, which I bought and was intending to live in, but it needed a lot doing to it. It did have actually water and electricity and possibly gas as well, I think it did have all three, but it was in very rundown old cottage state and would have needed a lot of money, but I did actually have an architect prepare plans for modernising it. And then I tried to borrow money and everybody said oh, for an old house like that you can’t borrow money. Today it would be totally different, you would get money for doing up an old house. And they said pull it down and we’ll give you ninety per cent of a new house. But just then the old man in the last twelve feet from there to there, end cottage, died and I bid £200 for that and I was in Canada at the time, I was told that he died. I told my Cambridge solicitor to bid £200 and he wrote back and said don’t be ridiculous, you can’t get a house for £200. And I said, I remind you that I’m employing you to do what I want, please bid £200 on my behalf. He did and I got it. So that I had the two put together and that gave me sufficient frontage for building this. And so designed this with the help of an architect to make sure it wouldn’t fall down. Those were the
bricks which were the floor of the old cottages and those shaped bricks, that’s the only thing left over from the old cottages. But as part of the contract to build this house, £100 was put in to take down and cart away the old houses – see how cheap things were then, two men – and being very practical they took off the roof and the rafters and the walls were clunch from flint and with nothing to support them, they just pushed them in to the cavity because the old cottage was below sea level – I mean below ground level – as cottages were and the fact that next door and opposite still are, below ground level, but for a modern house you need hardcore to build up to whatever the specification is, so many inches above ground level. And so they just pushed these because there was nothing supporting them, and they crashed into the space – they had to dig around to get more space to get this thousand square feet – and so spread it out and then spread concrete on top and then build the new, build a new house. Two men did the whole thing until it got to specialists like electrics and plumbing. They did the bricklaying, they did the roof, probably not the tiles, probably a tiling company. So some of it was done while I was in… was I in Canada? No, I had come back by then, so I drove out from the Scott Polar in my car every lunchtime to see how they’re getting on, because the architect is supposed to be responsible and did inspect the work pretty frequently, but they’d actually laid out the plan three feet different, they made assumptions or misread the plans, from where I intended. Turned out to be a good thing because it gave a minimal path round that side, more room round this side, and there it was. So it was built and I moved in and had a housewarming party on the twentieth of December 1958, which I repeated on the twentieth of December 2008 in the same room, had a party here with all the survivors of fifty years before.

[0:35:26]

And so I built this as a bachelor, but anticipating that I would want to marry, but not having enough money to make it bigger, and it might not have been allowed on this site. And I knew by then that I was going away to Canada for quite a time and that – or to the States for quite a time – and so I built the garage inside the double wall, and a big garage, hoping to let it, as I did, or my agent did to US Air Force officer from Lakenheath. And I built the garage big enough for his Cadillac. Well, that was very useful because when I came from the States with a family, all we had to do was build a wall at the front and make two bedrooms out of the garage and I forget when, but I was able to build a garage on the side here. And so it all worked out very well, but I think it’s a completely logical way of doing things, is to… and the public transport here was pretty poor, so car, house, wife, family, the logical – most
people don’t do it in a logical way, they fall in love and struggle to find somewhere to live – but I thought I did it the right way and I never regretted it.

[0:37:24]

*Did you have any particular design in mind when you – you said you designed the bungalow yourself?*

I did. I had a Canadian book of Canadian Central and… Central and Mortgages and Housing Association – CMHC – with a very nice variety of designs in it, but being Canadian all built in wood, but it was the layout and the plan that I got a lot of suggestions from. I’ve still got this book and the only difference was, here we build in brick, but in terms of the layout of the rooms, I decided, I said to the architect how much does a house cost and she said, two pounds fifty a square foot, as it was at the time. And so I said well, I reckon I can stretch to a thousand square feet. So I started in the way that is very difficult and most people find impossible, but I had to be practical, I drew a rectangle of a thousand square feet and then moved walls inside that making my plan. And the architect had some contributions and of course people looked at the plan, they said well that miserable hall only this wide, surely you can have something more welcoming. I said yes okay, but which room would you compress on either side - the bathroom, my office - in order to get more room in the hall? And so that was what I planned in getting the shape of the thing right within my thousand square feet. Two bedrooms, one of which is my office now, and so when we came back from the States I quickly built a bedroom up here in the attic for the older daughter, and it’s still there. Incidentally it was the first part of the attic that was insulated. So that we had that bedroom for the younger daughter and the upstairs bedroom for the older daughter. And since I was doing all my work in the office I didn’t need an office, I mean that was not inaugurated as an office until after I retired and I needed an office. So that’s the way it worked and I think it’s worked out well.

[end of track 10]
Okay, could you start by describing your first sight of the Soviet liner, the Estonia, the first leg of your journey to Antarctica on the Russian expedition?

I joined Estonia in Le Havre, France, which was the first port of call and the only other port of call was Fremantle in Western Australia, but they called in France to pick up a French crew which was a crew of scientists who were just coming for the summer to set up markers to measure the distance to Vostok station, the coldest place in the world, and also the elevation. Elevation done by barometer is not accurate because you’ve got a steady pressure difference between two places which you don’t know about and the only reliable way is by conventional theodolite and distance measuring survey, taking reciprocal angles which cancels out the refraction between two stations.

I wonder whether you remember what the ship actually looked like to you?

Estonia was a passenger liner and she was chartered, cheaply they said, by the Antarctic expedition during the northern winter, southern summer because she was not in normal service and in normal service during the northern summer she was running between Leningrad, Stockholm, Copenhagen and London carrying tourists. And we had her to take the whole Antarctic expedition. There were more than a hundred expedition people on board, but housed comfortably in passenger cabins and fed well by Soviet standards. I mean that, in that they said they got an extra ration, an extra allowance of food on the Antarctic expedition compared with what you would be rationed at home.

[0:02:36]

Now the first Russian station that you stopped at was the Mirny station where you were the January 1964. Could you describe to start with the appearance of that station – the look of the buildings, the layout, the state of repair, that sort of thing?

Mirny Station was the principal Russian station on the coast and it was at the top of a cliff about sixty feet high and initially the buildings had been built on rock, on a small nunatak, and then they needed to expand and the nunataks were too small so they built some on ice
hoping that the wind would keep them clear, but it didn’t and the, most of the huts got snowed over, snowed under and this involved a lot of digging and it was dangerous in that the… a fire could kill everybody in a hut. Huts under snow, we didn’t think about this much at Maudheim, we should have, but huts under the snow you put an entrance at each end to ensure a fire escape from the other, but if you have a fire both exits automatically become flues, chimneys, and you could say well, where are you getting the air from for the fire, and the answer is you’re sucking it through the snow which is permeable, so the intake is the surrounding snow and both entrances become chimneys and that makes it impossible to escape because a single breath in a fire is going to kill you. And they had a serious fire and killed seven people and it was only known about when the mechanic on duty at the central power station noticed a power failure in that hut circuit and phoned them and someone picked up the telephone and yelled one word, ‘Fire – pozhar’, and that was the last ever heard of those people, they were killed by fumes.

[0:05:17]

How would you compare it to the other research station that you’d most recently been to, McMurdo research station, the American one – how did it compare as a research station?

McMurdo was all on rock and had a large area of rock on which you could build conventional buildings out of wood and prefabricated panels and therefore did not get snowed under and that made life a lot easier. The Russians were limited by area and only a hundred metres from the huts there were crevasses began, so you couldn’t wander off and I think over the years one or two people have wandered off and got killed, people who [coughs], people who don’t know what a snow bridge looks like. I did but I could see where not to go. But the Russian station was efficient and separate huts for living in, separate huts for eating in and the Russians were extremely friendly and at that time I had very little Russian but I was driving a tractor for them right from the start during the period the ship was there.

And leaving aside the fact that geographically the site of the stations are very different which altered how they could set things out, was there a kind of Soviet way of establishing a station, organising a station that made it different from the American one?
That’s a good question. There are enormous differences in that in a Russian station everything is hierarchical, that there is a leader who can tell people what to do, which in principle is not different from other nationalities, but the amount of authority exerted by the man in charge varies greatly. In the Russian station you do what the daily orders say. In the American stations each person has their department and responsibilities and certainly doesn’t get orders from above. They may have meetings to decide on how to proceed and the military part of the American programme which was very largely military support at the time, the military was only there to support the science and they had the normal military hierarchy, but the scientists I think sometimes confused, generally annoyed the military in that the military would say, well who’s in charge and some very junior person would say, well I’m in charge of my own project.

I wondered whether they actually, I don’t know, set out scientific instruments differently or used different instruments or had different priorities? I know that you describe the novel aspects of the sort of social organisation of the Russians. I wondered whether there was something novel about the science – is there anything specifically Soviet about the science that you’ve seen?

No, the Soviet science was essentially the same in that after the International Geophysical Year there was still an international agreement to continue with certain basic sciences like meteorology, upper atmosphere, aurora, seismology, geomagnetism, and those programmes were continued in many stations of different nationalities throughout the Antarctic. So those programmes were similar, the instruments were similar in different nationalities.

[0:09:47]

Thank you. Could you describe the, now, the station that you worked at for most of the time? I’m afraid I’m going to have to ask you to pronounce...

Novolazarevskaya.

Thank you, yes. Could you describe that one?
Novolazarevskaya was a small station built on rock but it was sixty miles inland because there was no rock on the coast, for many hundreds of miles on that bit of coast there’s no rock at all. And first they built it on an ice shelf, as many other stations, but there was so much snow accumulation everything got buried and it was very difficult to operate, so they decided to move what they could - although most of it had been buried - with tractors to this nearest nunatak, which was sixty miles inland, and set up a station on rock which was easier to maintain. Of course that meant you had to take everything there in tractor trains, but only once a year. We had two tractor trains; one for food and general supplies and one for fuel and that was that for the year.

And the… in your book, Vodka on Ice, there’s a plan of the station. Could you describe its appearance as you… let’s start with the interior – could you take us on a tour of the interior of that station?

There were mostly standard huts made out of insulated panels, prefabricated and you just had to join the panels. Flat roof, and so some were separated into rooms by internal partitions and others weren’t. The eating hut had a large main room which was dining room, lounge, library, cinema, all thrown into one, and a kitchen as part of it in a separate room. And the others were divided into rooms according to disciplines and where the instruments were housed. So there was a radio room, there was a meteorology receiving room and outside there was a balloon launching building, there was a Rawind aerial which was essentially the same as at Maudheim. And a hundred yards away was geophysics building where I lived with three geophysicists and a hundred yards further away was an all-magnetic hut for the magnetometers. Now, if you’re studying geomagnetism, the magnetism from one steel nail is going to upset things so that magnetic hut had to be made entirely using copper nails and isolated from other magnetic fields.

[0:13:22]

Thank you. I’m going to name each of the scientific buildings that are on the plan. Could you, as far as you remember, take yourself back, sort of step inside the door and describe what you see in that room in terms of its layout, the instruments, that sort of thing. So if we could start with the geophysics building?
Geophysics building had an entrance hall and three rooms. One was my bedroom together with Anatoly Norman who was the fixed station seismologist. The other was, two others, the Czechoslovak magnetics man and a Russian. And so two bedrooms with all our work inside the bedrooms except for one small room which housed only instruments. We had our own loo in the building, which was a hole in the floor with an empty fuel drum underneath and pretty draughty because it was unheated and when the fuel drum was full it had to be rolled away and ideally disposed of in the sea at the time and a new one put underneath. And since all the fuel for the generators and cooking and everything came out of forty-five gallon drums, there were plenty of empty drums to use for this purpose so we didn’t have to empty the sewage barrel, which was all solid anyway, it had to be rolled away.

[0:15:35]

*And what instruments were in the geophysics room?*

There was a fixed seismic station, that is in three directions – two horizontal and one vertical – which had to be on concrete very firmly attached to the land. So that was in one of the rooms, the concrete being built up through the floor and then the instruments laid on top of that so that they were detecting the vibrations of the earth underneath. That was one room and that had to be kept in the dark because the recorders were powered by light beam and the light beam was playing on to photosensitive paper, so the photosensitive paper had to be developed at intervals laboriously in normal developing solutions and then dried and it had to be checked at least once a day to make sure everything was grinding away. And we detected the Anchorage, Alaska earthquake and we of course only had… we knew that it was a major earthquake but didn’t know exactly where and it was later in the day that we heard on the radio that it was in Anchorage, Alaska and had shaken down half the city. The other room was some other magnetic instruments, I don’t know how to describe them, and the two bedrooms and in our bedroom we had a radio to get time signals, but everything had to be very precisely timed. If you’ve got a seismic station, the time of the vibration coming through has got to be as accurate as possible, tenth of a second at least, so we listened to the radio every day. I listened to the BBC news, he listened to Moscow radio news and he could, he was fluent in English and in the latter half of the year I was fluent in Russian and sometimes the narrative on the two different stations of the same world event was so different that we could only burst out laughing. I thought the Moscow end was Soviet
propaganda and he probably thought the BBC was British propaganda, but we never took it seriously, it was always a laughing matter. And the world was very remote from us there so we didn’t really care about the rest of the world. That was about the sum total of the geophysics hut.

[0:19:06]

_Do you remember one example of a news event broadcast in different ways from each side?_

There were many of varying degrees of contrast. Of course there were certainly many which were factual and didn’t differ, but bad news from the Soviet Union was delayed while they considered who should hear it and what the effect of Russians hearing bad news would be. That is internal Russian bad news. There was always delay on that, whereas the BBC might hear of them before the Russian public and an example of that is when Khrushchev was deposed, I heard it before anyone, on the BBC and it was some hours later before it came out on Moscow radio. But between the time it was broadcast on the BBC and the Soviet announcement, my colleagues started speculating about why he was sacked. They immediately accepted my version that this had happened and it was a news report because there wouldn’t have been any purpose of the Western media inventing that report. And they thought the principal thing which had got him into hot water was the idea of supplying the Soviet Union with wheat from virgin lands, Siberian lands that would be ploughed up and planted with wheat, and avoid the import of many thousands of tons of Canadian wheat, Canadian and US wheat that was brought in every year to supply the Soviet Union. So it was a lovely idea but the science behind it and the choice of soils on which to plough up was bad, and so the yield of this whole project which was held out as being something wonderful that the Soviet Union was going to be self-sufficient in food was pretty much of a failure.

_The other instruments that you said you didn’t know how to describe them, did you know what they did at the time?_

Not exactly, no. I could always ask them and they would explain, but I can’t remember. This is after all half a century ago.

[0:22:05]
Thank you. And could you do the same with the meteorology building? Walk inside and describe?

Yes, the meteorology building housed the radio office. There was one radio operator looked after everything. And had another room with instruments to record the daily radiosonde balloon which was international project done by almost all stations. And then… and second radio room which had a tape recorder for broadcasting music throughout the station and that was a reel-to-reel tape recorder and I was horrified at the quality, poor quality of it, because it was yielding iron filings, a little pile of them beside the recording heads scraped off the tape because it was not properly integrated into the tape. It worked and music worked fine, but I brought my own tape recorder with my own recorded music and higher quality than anything they had, and I tried playing some of it on their recorder but it was obviously damaging my tape, so I stopped that.

Is that all of the meteorological equipment in that room?

Yes. The Rawind was a separate small building outside with an external directional aerial, so that was all in another building, but the meteorological instruments were utterly conventional inside, conventional recorders.

[0:24:10]

Thank you. Do you remember the inside of the aerology building and the equipment there?

I don’t even remember calling it an aerology building, unless I’m referring to the one with the big directional aerial on the outside and it was a very small hut with the aerial mounted on the hut, and that was aerology.

And what was the directional aerial measuring?

It was doing the same as at Maudheim, recording the direction of the daily radiosonde balloon. But the radiosonde was recording the altitude at any given moment, so by the
altitude of the balloon and the angle of the transmission from it, you could work out the wind and various heights.

[0:25:12]

*And the glacio… what’s described on the plan anyway, as the glaciology laboratory?*

Yes, well I was the only glaciologist that winter. There had been a pair of glaciologists in earlier winters, and so it was simply their equipment; hand ice drills, microscope and not much really, and they were… I don’t know what they were doing, there were some publications out but the trouble for me was that all the science at that station was station science and I had never been confined to a station, I’d always needed to travel to do my work. And the only work I could do without going away – and they wouldn’t let me go anywhere alone – was to put out some markers on the ice within ten or fifteen kilometres, which they collaborated with and drove me out in a tractor and helped, and then measure a baseline between two little points on the rock and intersect each one of these markers with a theodolite from each end to get the position and then repeat this after some months and get the speed and direction of ice movement. This was all successful, but that was the only work that I accomplished during the whole year because there was no other opportunity. I did look at some ice crystals, but unsystematically, had nothing really to contribute. And at the end of the year I wrote a report in English, my roommate translated it all into Russian and when we left after the year, two glaciologists came in to winter at the station and so we handed them all my results so that they could build it into their own work as an extension of whatever work they were doing. And they did indeed and it’s all published afterwards in Russian.

[0:27:48]

*Why do you think that the science there was station based?*

All of the stations had station based science and there had been travelling out from that base in its earlier years. There had been aircraft there; the Antonov II, a small twin-engine aircraft about the size of a Twin Otter, but a biplane, and they had done a lot of aerial photography of the mountains within a couple of hundred miles, vertical photography, overlapping. And they had done astronomical observations inland to provide a framework on which to hang the
aerial photos and thus produce maps. And they did, they produced some quite good maps of
the whole area. But that had been done and that was finished and there were no other
programmes which involved travel.

Was there a particular reason why in that year it was station based?

The absence of proposal for fieldwork was probably the reason.

[0:29:13]

You’ve mentioned that the geomagnetism hut or building had to have the copper screws so
that the equipment wasn’t affected, how was the equipment that was there measuring
geomagnetism and why?

Well, there was a horizontal magnetometer and it was mounted on a tree trunk about four feet
high and so it was not recording, it was only observed by Vereshchagin twice a day perhaps,
traced up there, but the other magnetic instruments were recording in our hut from sensors
which were placed well away from the hut.

Were there some overall expedition aims for that particular Russian expedition and if so,
what were they?

The overall aims were to carry on the station observations which had been going since the
International Geophysical Year and as far as I know are still going today.

[0:30:45]

Thank you. You mention towards the start of your book that the Soviet expedition was
divided into two groups: one, seismology, geomagnetism, earth currents, aurorae, cosmic
rays, radio propagation, aerology and meteorology, and then the other you describe as
exploratory, mapping, oceanography, geology and glaciology. I wonder whether you could
expand on that distinction for people not aware of any of the terms?
Well all of the first group were on the station, measuring things which can be measured from the station. Earth currents is measuring the electrical field in the ground which is influenced by solar radiation and very small, very, very small currents which have to be amplified to measure, but all the other subjects could be measured with instruments on the station and so there was a clear distinction between travelling programmes which didn’t happen at all in our year, and station programmes. And all Antarctic stations observe some of the same things simultaneously and travel is a sort of optional interest for glaciologists, geologists, map makers, and any other reason you have for travelling, sometimes to get a wider baseline for observations of aurorae and to measure the height of aurorae.

[0:32:30]

Thank you. I’m interested in really the location of this science because when I think of your work studying glaciers, how they move, how deep they are, how they deform, it would be absurd to ask you why were you doing your work in Antarctica, because that’s where the glaciers are, so it’s a question that doesn’t arise in your case. I can see that with geologists looking at the rocks in Antarctica and looking at the evidence for continental plate shifting and correspondence with other places, that’s where the rocks are. But I wonder whether you could explain in terms of some of these fixed scientific activities, why they were being done there. So if we could start with the example of studying the magnetic field – why study it there?

Because in order to understand it all you need a network of stations all over the world and this was just part of the network.

And seismic activity?

Similarly, you can’t pinpoint the source of an earthquake except by having a large number of stations in the world.

And photographing the sky with a fisheye lens – why there in particular?
Aurora. That was a standard observation in both polar regions: Arctic and Antarctic and explaining aurora and its relationship to solar emanations is never fully answered and it was all part of compiling the data to answer that question.

*And was there any particular advantage of using an ionosphere sounder in Antarctica as opposed to anywhere else?*

No. The study of radio propagation, understanding of radio propagation is done at many, many stations all over the world because it varies in different areas, different frequencies penetrate the reflecting layers and this is observation done all over the world, ionosphere. It’s still not fully – most of it is understood but the variations with time are not fully understood.

*This is interesting. Apart from the aurora then, which presumably is, needed to be observed there, in any other case is there a particular advantage that Antarctica offers over other places?*

No, for the most part not. It’s simply that geophysicists want a network of stations all over the world to understand the differences in different places.

[0:35:48]

*Thank you. Could you comment further – you comment a little bit in your writing about this expedition – but I wonder whether you could comment further about the scientific specialisation that you witnessed on this expedition?*

The Russians were essentially observers rather than scientists. This may sound like a harsh judgement, but in the West the people who observe are usually people who want to write up and publish the results in their own name. But the Russians didn’t. They were very well trained and meticulous, diligent observers and had been taught how to calibrate their instruments, frequently calibrated them so that they can be compared with observations at other stations. But that was their business and they did not expect to take any part in writing up and publishing the results. The only people who were different, the Czech man intended to but I’ve never seen any published work, but I probably would not have because it was in
that language, and the doctor. The doctor did publish a book afterwards on his observations. Now medical research was a sort of by-line because you had to have a doctor in case anything went seriously wrong, but on the other hand we were fourteen very fit men and things didn’t go wrong, so he had to have something to do so he decided what to do, physiological research, and the same is done at British stations. And he published his own results. He told me he’d published his book of physiological studies in the Antarctic, he wrote to me afterwards and said could I get it published in English, but there’s really no chance of that.

_How did his research differ from that of Ove on the Norwegian-British-Swedish?_

Ove Wilson. It didn’t really differ. He was not measuring the oxygen consumption as Wilson did, but he took blood tests and what I remember is blood tests, he certainly listened to our heart sometimes and he looked at our teeth, although he didn’t as far as I remember do dental work at all, he didn’t consider himself qualified. I can’t remember any dental problem among any, but if there was a minor dental problem I probably wouldn’t have found out about it because he would have discussed it in his office, in his room and I wouldn’t hear about it.

[0:39:13]

_And returning to the description of the Russian scientists as observers principally, trained observers in a particular field making records that they didn’t themselves wish or see themselves as having the role of publishing in relation to it. Why do you think that was the case with Russian scientists in Antarctica?_

I suspect it’s because they couldn’t get enough volunteers from scientifically qualified people, whereas observers do it as a job and many of those subjects they studied were in writing up, involved comparisons between one station and another in a different place and what that meant, interpretation of that. And so I think they found it harder to find scientists willing to spend a year in the Antarctic, but the observers were highly paid, they were being paid more than I was, they were being paid three to four times their salary at home as incentive. And I think they all enjoyed the life, but perhaps most of all they enjoyed coming home with a big pile of money.
Who did write up their results then?

People in the Arctic and Antarctic Research Institute in Leningrad, which had a staff of 500. There were people there who collected all the stuff and published it.

Were they not employees of the Institute?

Yes they were, but they were more… more scientists rather than observers. They probably had done a winter or two themselves as observers but they stayed home to take in and analyse other people’s records.

[0:41:37]

I see, thank you. At various points on the trip you study other things. I know that your main work was the stakes and surveying and ice deformation, but you also make a tidal gauge?

Yes. That was entirely my idea because study of tides round the Antarctic, very little was known, but the other thing is that if your ice is going up and down on the tide you know it’s floating and there was discussion about that and some people thought it was aground, other people floating. And I could see from tide cracks round a sea lake at the foot of our nunatak, which was about twenty minutes’ walk from the station, that there were tide cracks so it was clearly going up and down on the tide. And tidal – people who studied tides want to have tidal stations all over the world so that the timing of tides can be predicted for shipping. And the tidal stations in the Antarctic are extremely sparse, a thousand miles apart perhaps, and here was an opportunity of doing it easily that I could see this ice was going up and down and so we constructed a little gantry to support a conventional chart recorder. It was a chart recorder that will record anything you want on a chart, it had a wheel at the end and the wheel moved the pen on the chart. And I said let’s drill through the ice and lower one end of the wire to the bottom with a heavy weight so that it’s sitting on the bottom of the sea, which wasn’t very deep there, I can’t remember, twenty or thirty metres, and then lead the wire up through the ice and over the wheel and then a counterweight on the other end so that as the ice went up and down and everything went up and down, the wheel would wind and unwind because of the counterweight on it. And we got extremely good chart records which, since it
was not a programme of the Soviet expedition, I was allowed to take home and sent them to the Liverpool Tidal Institute which collects tidal information from all over the world like the Admirlalty, may be part of the Admirlalty for all I know, but it’s Tidal Institute, and they analysed these and published the results alongside many other published results which they do as a matter of routine. So they were very grateful and said they were very good records made by an unusual method.

[0:45:14]

As you’ve mentioned that word, I wondered whether you could say what the – unusual – I wondered whether you could say what the Russians thought of your scientific activity on the expedition?

The Russians were pretty clear that I didn’t, had not found out before I went what I could do. I had corresponded a great deal, and I still have the correspondence, with Shumsky in particular who was a very distinguished Soviet glaciologist, but was in the Academy of Sciences and not the Arctic and Antarctic Institute in Leningrad, so he didn’t know everything going on and so I asked him what I could usefully do and he had to try and find out from Leningrad. Well he didn’t get any information from Leningrad or if he did it didn’t come to me, because the background of all this is that Russians were terrified to write a letter to an individual abroad except through Academy of Sciences up to the top and then transmitted to another nationality by whoever was allowed to do that and then fed down to the man on the shop floor, so to speak. And whereas in the West we’re used to writing direct to any scientist, and I had written a number of letters trying to find out what the station was doing and therefore what I might do usefully. Had no answer at all, so that I was completely in the dark when I went there and it was simply a matter of discovering on the spot what I could do. They had not been told any particular programme because I had not told them any programme because I didn’t know what they were doing and I didn’t know what I could do in the circumstances. And so my work was simply thought up on the spot and since I knew how to measure ice movement, that’s what I thought would be useful.

[0:47:29]
You also did something on the coast which involved marking some exposed rock and then taking heights from that, putting a permanent benchmark in. Can you remember that was...

Yes, we, as with the Vostok station being a long way from the sea, its height above sea level had to be determined the hard way. Well we had the advantage that having a sea lake right at the foot of our nunatak meant that there was sea level, at least sea level in our hole for the tide gauge, so we could see where sea level was. And the meteorologists in sending out their six hourly met reports through the world network had been applying a correction factor based on long term average barometer readings between the sea, ships at sea at the same time as at the station, and calculating the height of the station from that. And so that height had to be reduced to sea level for every observation they sent to the world network. Well, they didn’t… I said, have you actually measured? You’re using this correction factor, but have you actually measured? And they hadn’t. So I said well here is a unique opportunity, and since they had a theodolite and a four metre staff and there were willing volunteers, it was very difficult actually, clambering down a cliff with only four metre staff because it meant that I had to set up the instrument many, many times, sighting forwards and upwards and backwards and downwards a chain of levels. But I repeated it on the way down and on the way up to make sure there were no mistakes and found that the station was thirteen metres above sea level. And I told them this and I thought it would be bad manners to check on whether they accepted my figure and made the change or just said well, for long term observations we should keep on using the same correction we have been, you see. But… and I think that was useful, determined the exact height of the mercury barometer in the meteorology room.

[0:50:32]

And were there particular scientists on the expedition who you recruited as volunteers to help you in your work? I notice you said ‘we’ when you were talking about the tidal gauge. Were there particular people who went along with you?

The station leader, Yeremin, was the principal one, he could see the value of doing this and he was the least busy, he didn’t have routine observations, he was just there essentially as leader. He had a small programme of his own, but he saw my point and I explained how it could be done and that we had sea level only a few hundred yards from our station. And so
he helped. And otherwise there were people who were having a few hours off and came to help us drill the hole through the ice and in order to avoid freezing of the hole, we had, we lowered a pipe through the hole we’d made and had the wire from the tide gauge coming through the hole so that the hole wouldn’t close and freeze up and filled with seawater, it never did. But I think it was only in summer months that we were doing this work.

[0:52:12]

Did they ever communicate to you what they thought of your science, because it seems to me that what you were doing seems quite creative and resourceful compared to doing routine observing. I wondered whether they said to you what they thought of what you were doing?

No, they didn’t. They [coughs]… their job was to do the routine observations they’d been sent there to do and so the idea of thinking up what might be useful was absolutely routine to me in all my work, but was foreign to them. And so what did they think of it? I had to convince them that it was worth doing and they were happy to go along with anything which didn’t involve countermanding any authority on the expedition. And they were very helpful. For example, measuring the height of the ice between our station and sea, the only way apart from optical surveying and we didn’t have time to do that, was to have an aneroid barometers. They had accurate, good aneroid barometers inside the caboose on one of the tractors and the rough… the ice was extremely rough and bouncing and that’s not good for an aneroid barometer or any other barometer. And so I suspended these aneroids from three bungee cords so that they weren’t getting any shocks and read them every half a kilometre or kilometre and produced a levelling survey the whole way to the sea, the baseline being the base elevation between being actual sea level at the coast and everything done relative to actual sea level. And this helped in determining the grounding line, where the ice shelf was floating and where you were resting on rock. Because where you’re resting on rock you immediately have a higher elevation that’s building up and I found something I knew from Maudheim, how you tell the actual line along which it goes afloat, or goes aground, whichever way you are approaching, is that you get cracks, tidal cracks because the ice shelf is thick so it doesn’t fracture through as sea ice would if it – sea ice is two metres thick – but if an ice shelf is a hundred metres thick there’s simply the flexing at the surface and the flexing produces small cracks, which if you hang around for twelve hours you find are opening and closing. And we had done this experiment on the Norwegian-British-Swedish Expedition because we realised we couldn’t say exactly where the coastline was and the
under ice coastline, and so I’d done this experiment before, but I didn’t actually have time to do tidal experiments but by that time I had published on these things we called strand cracks and they were generally accepted and our explanation was generally accepted as what they were, flexing at the boundary between floating and grounded ice. And so I didn’t feel I needed to justify that, I simply recorded it on our traverse where the grounding line was.

[0:56:36]

This would be one example of you recognising a landscape feature that you had studied on an earlier expedition. Were there ways of seeing the area that you were able to offer that they couldn’t, being more sedentary scientists?

There probably were but they weren’t interested. They were doing their job. I was doing what I would have done given the opportunity and had done on any other expedition where I was thinking of understanding the landscape really, and I was, part of understanding the landscape is knowing which direction the ice is flowing and in that particular area the flow is unique and confusing in that the ice comes down off the inland ice, goes on to the ice shelf, then part of it you could see the flow line from a medial moraine, turns towards the nunatak and flows towards the nunatak. Well, on the face of it you say well, that’s impossible because it’s got nowhere to go except slap up against a rock face. Well, it was turning and it was moving towards the rock face, but melting as fast as it moved towards the rock face so the coastline stayed in the same place.

Is that something that you determined while you were there by observing?

Yes, you could see it from where this medial moraine went, that it turned towards rock. But that was naturally of interest to me who was interested in what direction the ice is moving and I’ve never seen that anywhere else. Probably does occur, but I’ve never seen it.

But no-one else on the expedition was observing in that sort of way?

No. It was not on their programme.

[0:58:51]
Could you tell me about the work of the oceanographers on the Ob ship, which – am I saying that correctly?

Yes.

Which is the ship that you took on after the Estonia couldn’t travel any further because of the…

Yes. The Russians had been very good at doing oceanographic observations wherever their research ships have gone in the world and they had sophisticated ice depth recorders, echo sounders, British made, which were able to measure up to five or six kilometres depth, which is not a thing you normally have on a ship. A ship is only interested in where it might run aground and so has the same sort of echo sounders as a trawler has. And so they were doing that, absolutely routine wherever they went, and recording navigation by sextant, which was the main method at the time, sun shots – sun shots and dead reckoning – and stopping at intervals to measure ocean currents. Now, to measure ocean currents you would need to have the ship stationary, so I don’t remember stopping to do that, but they were certainly checking the instruments on deck, I photographed them doing it, but I can’t actually remember the instruments going over the side. Probably they did when we were anchored anywhere and the ship was standing still, and they’d measure the speed of the currents, speed and direction of the currents.

[end of track 11]
Could I ask you, what was your view of Russia and Russians before the expedition?

I would think my view was based on what we knew of the Cold War. But I had been to international conferences preparing for the International Geophysical Year in 1955 and ’56. I think I remember Stockholm conference which was a very important part of preparations when things were agreed and problems were solved, which could have been very tricky in that the Russians and Americans both wanted a station at the South Pole for prestige reasons and it had to be ironed out without offending the other and the Americans certainly automatically thought the South Pole was a good place to prove the capabilities of the United States and they had, in their minds, chosen this site and when they found the Russians wanted to go there too they said, well this would be silly, and they had to rapidly think up what would save the self-esteem of the Russians without giving them a second class station. So they said, well scientifically it’d be more important to go to the geomagnetic pole because for many sciences that would be the centre of all things and luckily the Russians were persuaded and went and that is Vostok Station, which is the highest station in the Antarctic and has no doubt benefited from being close to the geomagnetic pole.

Could you tell me more about the conference that was preparing for the IGY, what do you remember of attending?

Well there were scientific delegates from all countries interested in taking part in the Antarctic – that’s twelve different countries – and the, certainly the Americans and the Soviets were prepared to push their points, but really they were scientific arguments about where the stations should be, they should be spread out to give a good geographical spread [coughs] and we should collaborate with each other wherever possible in terms of shipping. There wasn’t much because separation was so far between stations, but everyone should contribute simultaneously to the global observations, meteorology, seismology, aerology, aurora, geomagnetism. And that was all agreed as being very important and that was faithfully carried out. And there was general Cold War sensitivity but since we were ninety-five per cent scientists, we could understand each other’s arguments. The top people in the
Soviet delegation often felt they were acting for their government more than for science and therefore were a little bit more sticky in terms of conceding anything. But it was remarkably successful in agreeing who should do what and where.

*Do you remember any sort of disagreement, public disagreement at the conference?*

No I don’t. There were sub-committees and there probably were in sub-committees, but I was not even a delegate, although I was permitted to go there because I was sufficiently… well, I was one of the people who’d wintered over recently and the other nations hadn’t done that. And so I was an experienced Antarctic person and probably invited for that reason.

*Did they ask you questions about logistics and scientific…*

I’m sure it came up in lots of discussions.

*Thank you. Now you also mentioned the Vostok Station which was the one that the Soviets took instead of the South Pole, the geomagnetic South Pole. I’d therefore like to go back to this question about the location of science. When you, you flew there on this trip to have a look, I didn’t get the impression from your book that you were there very long, but you looked round…*

Twenty-four hours.

[0:06:01]

*Did what you saw there indicate that science was being done in a particular place for a particular reason? Was there anything different about the science being done there?*

No, I would suspect that there were the same observations being done as elsewhere, but the position near the geomagnetic pole would make a particular significance in the observations taken there, but they were the standard observations and there was an American exchange scientist there. The Americans had exchange scientists since the beginning of the geophysical year and he was ionosphere, I think was his subject, yes it was, but otherwise
they were the routine observations and their observers had worked at other stations and were completely familiar with what they had to do.

[0:07:04]

Thank you. You said that before you went on the expedition your views of Russia and the Russians would have been the prevailing ones related to what you knew of the Cold War. Could you say a little, sort of unpick that a little more and say what that involved?

Well my views were probably unusually liberal in what I had learned from Maudheim is that nationality means very little among people who are dedicated to doing a particular job and I found the same with the Russian scientists. They had to look over their shoulder more than I did, consider whether they might be rapped over the knuckle for agreeing to something, but my agreements were about persuasion and not signing any document. So I think everyone in the Soviet Union had this problem of hierarchy, looking over their shoulder, can I get into trouble by what I’m doing or what I’m saying. And from the West we don’t have that problem.

So leaving aside the fact that you regarded Russians just as you would regard any other nationality, what were your views of the merits or otherwise of the particular social, economic and political system?

I had a completely open mind and wanted to find out what the merits were and there are some merits in that it’s a command economy and the government can decide, well just about everything, and if they take the right decisions that should in theory be a good thing. On the other hand, it stifles individual initiative because if you have individual initiative you have to look over your shoulder all the time, see whether it’s permitted for you to do anything different. But I concluded at the end of my time with the Russians that there was not on balance any merit in the system and it could only ultimately work in conditions like a monastery where everybody agrees to sign away their own rights and have one boss and that’s what in effect you were required to do by living in the Soviet Union, is be part of a hierarchy and be very careful not to cross the unwritten boundaries. And I’m afraid to say it’s still the same, although they have no longer officially a communist government, the hierarchical aspects of life in Russia are virtually unchanged.
Is there any link between this stifling of initiative or moving outside set structures and the kind of science that they did in terms of it being standardised recording, specialised, routine?

They had some good scientists, but they were a small proportion of the people they sent to the Antarctic and I – how do you distinguish between a scientist and observer? I think the observers probably, as in the vast majority of the support staff in the American expedition, went because of the pay, higher pay, whereas a scientist is motivated by his science. But the people on my station got three to four times what they were paid at home, so they were there for the money and readily admitted it and they would go home and their wives would welcome them home and say, what have you brought home? And they brought home lots of money and the first priority was to move into a bigger apartment because the official state Russian apartment was six and a half square metres per person, and that included hall and kitchen and bathroom and everything, six and a half square metres. That was the official, you couldn’t always get your official amount, but you could not demand more. You might hope for more and in some towns and cities you might get more, but the government was aiming for, their target was six and a half square metres per person. But, if you bring money, you could move into any size and they said you could move into a castle if you have lots of money acquired legally and anybody who’s rich in the Soviet Union, like anybody else, you ask yourself where do they get the money. And there was certainly corruption in the Soviet Union, at least as much, if not more today. But the other thing they wanted to do is buy a car and out of the 170 people or so on the ship on the way home, not until we were on the way home were they allocated thirteen cars. They all had money to buy a car by then, but cars were rationed and it was a lottery and they literally held a lottery as to who would be able to buy a car, bearing in mind that probably half the people coming home wanted to buy a car and had the money. And so these thirteen cars were shared out and I can’t remember the sharing out. The doctor, our doctor already had a car, he had a Volvo, second or third-hand, but none of the others had cars. And so that was one of the great ambitions, either more space in their apartment or a car.

Who were the exceptions in terms of the scientists that you were aware of, the Russian scientists as opposed to observers?
Well in my subject Shumsky wrote a textbook of glaciology which was so good that it was translated by the Americans at government expense and published in the States.

What did your Russian colleagues on the expedition say about the West, and perhaps about Britain in particular? What did they reveal of their impressions of Britain and the West?

Well they all had preconceived ideas of what the social situation was, the fact that there were wide class distinctions, because the Soviet Union claimed to be a classless society. In fact their hierarchy was rather greater than in the West in a different kind of way. And they had all this propaganda throughout their upbringing that in the West people were not free because they were servants of capitalists and did what they were told, whereas in the Soviet Union you were free. And this was firmly drummed into them as the raison d’être for the Russian Revolution, is to get away from a class society in which the capitalists owned all the resources and had everybody else working for them, which was the situation before the Revolution. But I suppose what we had by that time was enlightened capitalism, wanting to exploit the brains of everybody, that there was a hierarchy but we were not ruled by the aristocracy. Because you own a castle in Britain didn’t mean that you had control over a lot of people. Had servants, yes, but you were not automatically high up in the hierarchy just because you were Lord So-and-so and had a castle. But they didn’t know that, they thought that the aristocracy ruled everything and that there were no limits to their amassing of wealth and if I said well, wealth was spread out more evenly they would say, well what about Rockefeller and the other arch capitalist in the States. Well I had to say yes, they did amass vast fortunes but there are not an awful lot of them. And so they looked down on the system in the same way we looked down on their system. So they saw us as hierarchical and we saw them as hierarchical.

Did your view of the Russian system change through encounters over the year and through conversations?

No, I gave it a fair hearing and thought about what the advantages are and there are certain advantages in central planning. You get things done faster, once a decision is taken they’re
done and there’s no argument, whereas in the West we argue for years about any new project. So there is that advantage which you can readily acknowledge. On the other hand, the disadvantage of their system is that it’s very difficult to be rewarded for individual initiative that wanted to do something that was not on the Five Year Plan. Whereas in the West ideas can come from any level in society and stand or fall on their own merits.

[0:19:21]

*Could you describe, one if you can remember that one in detail, or a typical one if not, the communist party meetings on board the ship?*

Yes. That was very interesting because I didn’t know at first who was the communist party hierarchy on the ship and there were very few people I could talk to easily in English because my Russian was pretty stilted at that time. One of the people was the chief engineer and I said, ‘Well you must have communist party people on board here’. And he said, ‘I bet you won’t guess who the party secretary is’. Well, it was a sort of taunt and so I said, ‘Yes, you’, and I was right, he said he was. And then there was a wall announcement, communist party meeting at a certain time and day, open to all. So I went to him and said, ‘Well does that include me?’ He said, ‘Oh yes, of course, it’s open to all’. So I went there and it was interesting because it was so much like a church service here, that there was a sermon which was a sermon as in church, based on the writings of Lenin. Now Lenin had changing views and very wide views about the rest of the world and Soviet society and of course Marx came before him. And so there’s enormous latitude in deciding on your sermon subject, as wide a latitude as there is if our Bible is your source of your sermons. And so it’s pretty free but you start with a quotation from Lenin’s works and then you can expand on that, what that means in practical terms. And so they were interesting and then that could result in discussion, but that was inhibited by the fact that people couldn’t stand up and say well I think he was talking nonsense [laughs], that would not be diplomatic. But to me it was just as boring here as some churches here and church sermons and I actually have a photograph of myself having fallen asleep, because a professional photographer, very nice chap, on the way back who spoke English and had been abroad, he snapped a photograph of me slumped in my chair at the communist party meeting [laughing] asleep, because it was as soporific as some church sermons here. And everybody listened politely and the discussion after the
sermon was limited because they were all looking over their shoulder. Certain things you could say, but you knew there were strictly boundaries you mustn’t go beyond.

*Did you feel those boundaries yourself?*

No, but I didn’t want to say anything, so I was the observer really. I just noticed there must be boundaries because there was nothing controversial. Whereas in a political meeting here you can be as controversial as you like. You can’t in church of course, it’s just not done, in the same way as it wasn’t done in a communist party meeting to contradict the sermon. So it was pretty tame discussion and not a great deal of it.

[0:23:56]

*Could you tell me about evening activities?*

Yes, on the ship there were movies every day and a lot of people playing chess. At Novolazarevskaya we had something like 200 full-length sixteen millimetre movies and a good projector and mostly these were supplied but there had been swaps between passing ships. Some capitalist ships, as they’d say, with movies that normal Russians wouldn’t have access to, but the vast majority were Soviet approved films and they were good entertainment. A lot of war films and of course the Russians were always the heroes and the Germans were being beaten, although there was a film about the siege of Stalingrad, which was pretty horrible. I mean they made very good war films, very realistic. And otherwise there were films about life in the Soviet Union, as in the United States, many, many of the films are about people who are better off than you are in money terms and the by-product, perhaps not intentional, is to show how you could acquire wealth and that makes a good film in a country where most people want to have more wealth. And the Russian films had essentially the same theme as to show how an ordinary worker was important, but would love to have incentives to get more material goods. And so I do remember one movie where a man was driving round the country in an open-top sports car, that was obviously the thing to aspire to and very few people can have had it, so many, many themes were the same as in the West, but crime was not because the theory is that in a socialist society where to each according to his need, from each according to his ability, there should be no crime because you’re being fairly rewarded for what you did.
So we had a year’s supply of *Pravda* every day from the previous year, which we had on the table according to the date. And so the fact that it was out of date didn’t really bother us because we didn’t bother to listen to broadcast much and we were following the happenings in the daily newspaper from one day to the next. The fact that it was twelve months old didn’t really matter. And what I noticed is that every day they had a quotation from a Western newspaper about social inequality and these were taken direct, correct translations without any comment because they didn’t need to. They were comments of social injustice. Now social injustice in this country is due to your bosses or to the government and that was always the reason for selecting that particular cutting and translating it. And so they were essentially supporting the preconceptions of a capitalist society, that the bosses were selfish and gave other people a hard time and that would not stop. Well, social injustice occurs every day in every country I’ve ever been to, so it wasn’t difficult to pick out these things, but if that is all you read about foreign countries and you believe it, and they turned to me and said, ‘Charles, is that true?’ And I said, ‘Well yes, it is true’. It was the selection that conveyed the message which they wanted, that capitalist society was corrupt, and I thought it was very cleverly done because they had it every day which gave you an overwhelming impression if you believed it, and they checked that with me and I had to agree that those reports were real, but they were selected.

*Did they show any awareness of being subject themselves to propaganda?*

To public what?

*To propaganda – did they, were any of them sort of cynical about their own system?*

Oh yes. They knew that a lot of things were not reported, bad things were not reported, crime was not reported, because the theory was that crime would disappear under a socialist system and air crashes were not reported because it implied that there was something wrong with their aircraft and there were certainly more air crashes in the Soviet Union than there were outside because I suppose poorer quality manufacture of aircraft. I mean they had very good and large aircraft, but the failures were more common than in the West and they were not announced and so I said I heard about a crash you had on the BBC and they said yes, our
government tries to suppress these things but the word gets around pretty quickly so we know what’s going on. They accepted the fact that they were censored.

[0:31:23]

*Did any of the colleagues reveal that they’d used in the past their science for military or surveillance purposes?*

Well, the weather stations on drifting floes in the Arctic Ocean, most of them had served on those. Those were taking standard observations, but they were also listening for submarines and it was the obvious thing to do if you have a station because submarines were going under the Arctic sea ice and everybody knew it and in the Cold War you wanted to know whose submarine was going there. We didn’t discuss it and I didn’t ever challenge them but it came up many years later when the station leader admitted that he had been at a station at the time when I went to the North Pole in HMS Dreadnought and had heard us. He didn’t know who it was, he knew it was not a Soviet submarine because of the acoustic signature, but I didn’t need to be told that, I knew they were doing this, as were the American drifting stations. The Russians always had more than the Americans. But otherwise they were doing all the normal meteorological observations to help in weather forecasting in the northern hemisphere. They were also doing useful oceanography in terms of sounding the depths of the Arctic Ocean which is five or six thousand metres deep in places, and so they had long wires to measure the depth and take water samples to try to understand the oceanography. But otherwise the weather observations, magnetic observations and so on were all standard and so probably most of the people I lived with had worked on drifting stations, or on fixed stations on the Arctic islands, but doing all the same observations.

[0:33:56]

*And I wonder whether the… so they wouldn’t reveal it at the time, although you knew that they had worked on the drifting stations, I wondered whether - there was a reunion in 1995 I think of all of your colleagues…*

Yes.
Yes. Yeremin, the leader, apologised for not having sent other than Christmas cards for thirty years because he said he was involved in a defence related industry. He didn’t enlarge on that because he was probably not allowed to. But he had obviously had some training in radioactivity because he was doing a little, I think semi-official study at Novolazarevskaya with a Geiger counter that he had built inside a lead chamber. He didn’t do it very often, he took soil samples and things. So he had been employed in something that he couldn’t reveal, but there was still the general idea that being too friendly and familiar with foreigners was dangerous. And so whereas I got Christmas cards from a number of them, or New Year cards at the time – they’ve started sending Christmas cards again now – but the New Year cards because they were officially atheist, all the time by, Yeremin did and one or two of the others but it gradually tailed off. And the meteorologist at Novolazarevskaya, well he was a meteorologist and oceanographer, he sent me a few years later the Soviet Antarctic atlas which was a superb production; high quality cartography, covering many different things with maps of well, geomagnetics and topography and geology and everything. I’ve still got a copy, but he sent me that and that was legal because it was published, but no letter with it. And I asked everybody what they’d been up to and most of them had, well they were all retired at that stage, as I was, and the, this oceanographer who sent me the book had said that he’d several times visited the UK while serving on oceanographic ships. And I said, ‘Well why didn’t you telephone me or come and see me?’ ‘Ka Gay Bay’, that’s all he replied – KGB.

What did you read into that?

Well, that it’s dangerous to communicate with foreigners either in or to a foreign country, because the suspicion, the Cold War suspicion. Why have you got a friend, you claim to have a friend in a foreign country, that’s suspicious.

[0:37:50]

And Nikolay’s lead chamber, could you tell me what he did with that?
Yes, he was measuring radioactivity of soil samples. Now that was probably a useful contribution because it was recording fallout from bombs, of course mixed Russian and American and British bombs, but it was probably a sensible thing to be able to plot a world map of residual radioactivity in soil and he was probably contributing to that. But he didn’t seem to have a regular programme and he was quite open about showing me what he did and how it worked, but he didn’t seem to be taking it all that seriously. I thought it was a fill-in time because he didn’t have any other project of his own.

[0:38:59]

*On the way home you asked to stay on the ship so that you could visit the Arctic and Antarctic Research Institute at Leningrad. Could you describe that Institute?*

Well the interesting thing is, the only port of call on the way home the whole way to Leningrad was on the Ivory Coast and the sole purpose of that was to pick up a cargo of teak and other hardwoods for the furniture trade, because all our holds were empty on the way home when we were a freighter capable of carrying a lot of cargo and under their command economy you were not allowed, ships were not allowed to travel around the world empty and here was a profitable cargo to pick up. So we were several days there loading logs, enormous heavy things. We were allowed ashore and I was completely free to go ashore, but they had to go in groups of three, of which one was to be a Communist party member. It was my roommate, Norman, who told me this and I could see they went in groups. I said, ‘Why are you afraid of going alone?’ Well, they didn’t at the time tell me that it was orders, they said, ‘*Provokatsia*’ There might be provocation against Soviet citizens. This was because of paranoia in their propaganda, that people might want to cause trouble with Soviet citizens. Well, if you got into trouble with the police it probably would be more complicated because I don’t think the USSR had diplomatic relations; they were just in there for trade. And so they went shopping and they had some money, they were given some money. Went shopping for whatever they wanted and the doctor wanted spare parts for his Volvo, otherwise they wanted pornography, which was difficult to come by in the Soviet Union, and crime novels because there was supposed to be no crime in the Soviet Union but the crime novels are fun to read, so the ones who had been in my English lessons bought Penguin crime novels. But otherwise the most interesting thing on that visit was that it happened to coincide with the American Presidential plane, Air Force 1, bringing back their President I think, who’d been
probably invited abroad, I can’t remember – it’s in the book probably – but he was brought back in Air Force 1, the President’s own plane, and we happened to be there and happened to have just gone round the palace, which was on the tourist circuit, when he came back and we could see after we’d been over this very lavish palace that there was a crowd outside lining the road for some reason, so we hung around until his motorcade came past with lots of motorcycle outriders and things. But going into the palace I told them that this was open for visitors and they of course didn’t want to go, even in threes, so I said, ‘Well I’ll come with you, it’ll be perfectly safe, I’ll come with you’. And so we were in a group, I can’t remember, about twenty or thirty of us, going over the palace and I had acted as spokesman saying who we were. No, I think I was saying we’d like a tour of the palace please, and he said, ‘What nationality?’ And I knew what he meant, but since it was ambiguous question I answered it for myself, ‘British’. I think he took that as applying to the whole lot. I told them to keep their mouths shut and we were duly shown over the very, very expensive marble palace. And later – am I confusing it with Nigeria – but I think the same dictator wanted to build the largest cathedral in Africa and he did, using oh, hundreds of millions of dollars’ worth of labour, but he was a dictator. He was a dictator of a small country in which there was more freedom than there would be in the Soviet Union and what impressed me was there were a lot of taxis around, not such good bus service, and African women were travelling in taxis, presumably to do their shopping. And I felt completely unthreatened wandering around, and so I found the British Council office and since I was still paranoid about losing all my records, I asked them to mail my fair copies back home so that there would be no opportunity for any Russian accidentally or otherwise losing them. And so they did that, very kindly. And so I had friendly conversations with a very small staff, one or two, in the British Council. And I don’t think I bought anything myself. So it was a very successful shore visit. I bought newspapers, I think I quoted some of them in my book, what was going on, and everything in French. And I got back on board and everybody was thrilled at their experience of wandering over another country’s capital.

Well, we took on a week’s supply of fresh vegetables, although we were still more than a week away from Leningrad, so for a week we had fresh oranges, which were wonderful and then they ran out and we were back to Soviet rations until we got to Leningrad. And I had asked whether I could leave the ship in Abidjan and fly home. Well had I asked? No, I know what it was. No, I had said to them that I wanted to come on to Leningrad just to finish off the expedition properly. And so they had to get permission, because I had no visa, for me
to come to the Soviet Union without a visa. And otherwise they could have required me to leave the ship in Abidjan and fly home. But just before we got there, only a day before we got to Abidjan they said we’ve received a message, you’re cleared to come into Leningrad. And in sailing down the English Channel I was embarrassed that I was within a hundred miles of my family that I hadn’t seen for a year and a half, so I put three notes in empty champagne bottles – Soviet champagne is very cheap and we had plenty on board – and threw them into the sea. Well two out of the three were actually picked up and sent to my wife, contained a letter to my wife. And by that time I had international postal reply coupons – these are things, international postal union allow you to buy stamps in any country, any currency – and these were philatelists who wanted me to send them back to them. Well, my view of philatelists is that I’ll send them one for their own collection, but not for selling, which a lot of them are in business of selling. And so I kept the international postal reply coupons, so in my empty champagne bottle I put my letter clearly addressed to my wife, international postal reply coupons without any covering explanation, but the explanation was obvious, and a packet of Russian cigarettes. And one of the bottles was later picked up by an Englishman on holiday in France and my air letter it was, was sealed, so he scribbled on the outside, you did the right thing with those cigarettes and threw them into the sea, because to any Western taste they are disgusting. [laughs] So he had a nice sense of humour. I forget what the other was, I think it was just delivered.

[0:50:53]

And then we went on, non-stop to Leningrad. Well the Baltic was still full of ice because this was late April, and there were icebreakers in the Baltic but we didn’t need one because we were thoroughly ice strengthened, so we sailed past a Baltic, a Soviet Baltic icebreaker, and into the port of Leningrad and then tied up and everybody flooded ashore to their wives and sweethearts on the quay. And because it was the Soviet expedition there were no immigration people there, it was all Soviets except for our one Czechoslovak, but he was the right side of the Iron Curtain. And they ignored, or were not told that there was a foreigner on board, and so I was leaving the ship there so I took all my baggage and Norman, my roommate, came with me in a taxi to find a hotel. And he found a hotel where foreigners stayed, the Oktober Hotel and I well remember coming into that because as soon as you ask for a room, which he did on my behalf, they said ‘Pass!’, meaning passport. So I showed them the passport and they fingered through it looking for the Russian visa and didn’t find it and my friend had to explain to them this very unusual circumstance that I was legally in the country but didn’t have a visa and therefore I had no time limit on how long I could stay
there. I didn’t want to stay particularly long and I stayed ten days because the May Day
celebration was coming up and they said we’re going to march in the May Day celebration,
as about a million people do, would you like to come too? So I did and it was a very happy
festive occasion with groups from a given factory or institution with a banner saying who
they were, marching down the main street which is a mile long, and into the palace square
and in front of a saluting base with civic and military high-ups on the saluting base, and then
we sort of disbanded, everybody went home.

While I was there I was shown over the city by Norman and what I remember is with great
discomfort going into the biggest cathedral, there were queues wanting to go upstairs or
something, and he swept past with me following, mentally elbowing people aside and saying
‘I have a foreigner, I have a foreigner with me’, and that meant you could jump queues, and
nobody objected. That amazed me. Privileged position of foreigners. And besides a lot of
sightseeing we went to the Kirov Ballet, which was second only to the Bolshoi Ballet and I
forget what was on, I think it was *Swan Lake*, and that was a very interesting occasion.
There were four or five of us from the expedition there and in the interval we had ice-cream
with champagne poured over it and it was a lovely combination, because champagne was
quite cheap, Georgian champagne, and they certainly didn’t have any idea that we were not
allowed to use the word champagne except on things which came from champagne country,
it was Georgian champagne. And went to my hotel, so I was free but I felt I might have been
followed. But on every floor of every hotel there’s an old lady earning a few pennies by
recording the times of coming and going of everybody and duly recording me. And a
glaciologist who was high up in the Arctic and Antarctic Institute invited me to dinner in his
apartment and he came and picked me up in his car, he had a car, drove like a maniac on the
horn. People who don’t have cars, get out my bloody way. And nice apartment, nice wife
and had a nice meal, and at the end of it we’d been drinking vodka and I really didn’t want
him driving me home. I said I’ll get on the bus. Well, he was very embarrassed about this
because he thought well, foreigner’s got to be treated better than going home on the bus.
And I said, ‘No, no, I feel completely happy getting on the bus’. I’d seen a bus stop outside.
And so he let me go and got back to the hotel, but virtually immediately after getting back
into my room the phone rang and it was him saying, ‘Oh, so you got home alright’. Well, he
couldn’t have done anything if I hadn’t because he wouldn’t know where I was, and so to me
that was his way of ensuring that he could tell the KGB that I had not diverted anywhere on
the way home from his house because it would become known, or he may have asked the
bosses whether he could entertain me at home. But that was very strange, you don’t normally do that.

[0:57:45]

And then went to the Institute and was shown over the Institute and was asked to give a talk about what I’d done and it turned out that it was an audience of well, at a guess, 500 and I spoke Russian and said what I had done and with lots of polite things about the expedition and at the end the Director of the Institute, who was very much a party man, stood up and thanked me very much for giving a good report of my work ‘in clear and understandable Russian’. My Russian was never grammatical, but when I apologised for that everybody said, ‘Oh that doesn’t matter, we know what you’re saying’.

[0:58:40]

*And what do you remember of the set-up at the Institute in terms of, I don’t know, equipment or work spaces or the science going on?*

I remember seeing their computer, their one computer which was about half the volume of this room, as high as this room, eight feet, and about half the volume of the room. And it had radio valves in it this high, glowing.

*Just under a metre high? Glowing valves?*

No, half a metre. And was packed full of electronic circuitry and that I’ve been told since was much less powerful than my PC. But for them it was a great thing they wanted to show off, their computer. I mean to have a computer at all meant that you were a well funded institute. And my visit happened to coincide with my old boss from Maudheim, Valter Schytt, with his wife. That was pure chance; he didn’t know I was there, I didn’t know he was coming, and we met up in the Institute and we were shown over the Institute together with an English speaking guide and this was good. And there was one interesting moment. The guide had been told, well here’s two foreigners, please show them around. When we were being shown automatic weather stations, which they use in the Arctic Ocean, in fact all other countries use them, some for drifting, free drifting weather stations or whatever else they report, and our Russian accompanying us who was sort of leading us round, I asked
about a more sophisticated station that I’d read about and the interpreters said in Russian, ‘It’s secret’. And so the Russian who was showing us around said, ‘It’s not available’.

*What was the nature of that, that you’d read about it, in what way was it more sophisticated?*

Well, automatic weather stations, I don’t think I really knew anything about it, but somehow I knew that there was a more sophisticated version and I naturally asked if we could see it and I forget how I knew.

*What was the computer doing, what was that for?*

I don’t know. Probably everything for everybody.

*And would it be true to say that the Soviets were advanced in terms of the technology that they were using in relation to your experience of other expeditions?*

No. Probably not more advanced, because so many of the observations in both Arctic stations and Antarctic stations were standardised. But in the Institute were the people who were analysing them, so my observers had to deliver their results in the form of charts and logs and calibrations of instruments and once they’d given those they were free, they’d done their job.

[1:02:38]

*How did the Institute compare to the equivalent in Britain, the Scott Polar Research Institute?*

It had a staff of something like 500 people and the Scott Polar is a tiny institution. And theirs was a national institution. Well we have a National Institution of Oceanography which is quite large, I would think certainly a staff of between a hundred and 500, so it doesn’t compare with a small university institution like the Scott Polar. I mean we have national labs which are much bigger and theirs was a national lab. And they provided the scientific staff, observer staff, for all the Arctic and all the Antarctic stations.
Is there a historical reason why by that time they had this large research institute with a sort of, for the time, cutting edge computer? Is there a sort of historical explanation?

Yes. They were the scientific arm of the administration of the Northern Sea Route, which was very important in trade terms to the Soviet Union because they were exporting timber coming out of the Siberian rivers and being exported all over the world. And I think that was the principal export, but also minerals. Most of the gold was exported into the Pacific through Magadan which was the centre of the Gulag Archipelago, because it had a lot of slave labour doing the gold mining. So there probably was some minerals which were mined nearer the north coast which went out by ship, I don’t know what, but obviously anything close to the Trans-Siberian Railway went out by rail. And the exports of gold from the Gulag Archipelago were through the port of Magadan and road connections to the mines.

[telephone ringing]

[break in recording]

[1:04:19]

…science.

The Institute began with its Arctic interest only because they were not doing anything in the Antarctic at all before the International Geophysical Year, so when Russia got into that it was logical that it became a polar institute rather than an Arctic institute. And that’s why the staff will have swelled substantially from the time they were looking after the Northern Sea Route. The Northern Sea Route was a very important trade because of timber coming out of the Siberian rivers and being exported all over the world. And I think that was the principal export, but also minerals. Most of the gold was exported into the Pacific through Magadan which was the centre of the Gulag Archipelago, because it had a lot of slave labour doing the gold mining. So there probably was some minerals which were mined nearer the north coast which went out by ship, I don’t know what, but obviously anything close to the Trans-Siberian Railway went out by rail. And the exports of gold from the Gulag Archipelago were through the port of Magadan and road connections to the mines.

[end of track 12]
Could you tell me about your return home from the Russian expedition and then taking up your post which you had arranged to take up when you got back at Scott Polar Research Institute, but funded by BAS I think?

Yes.

And Gordon Robin had asked you to develop a research programme in glaciology. Could you tell me about, you know, beginning that new job?

Can I finish the Soviet Union first? I went home from Leningrad and I thought it would be fun to go through, go by rail and call on Valter Schytt in Stockholm and so I decided off my own bat to go… there’s a Leningrad, there’s a Finnish station, or it’s called Finnish either, or that… yes, Finland station in Leningrad. So off my own bat I went along to there and knowing perfectly well I wouldn’t get it I said I want a single ticket to Helsinki. Well of course that’s horrifying, you don’t do that in the Soviet Union. And after very rudely saying, ‘Forbidden’ in Russian, I went on, I said, ‘Why not? I have money, I’ll pay for it.’ And this lady was getting more and more annoyed and eventually she said, ‘Pass?’, as they always do, very rudely. So I handed her my passport and of course then she softened greatly and said, ‘Well I can’t sell you a ticket, you have to go through Intourist’. So it was an intentional provocation on my part because I knew perfectly well I couldn’t buy one at the station, but from my point of view, why not? I had money. [laughs]

Testing out your new Russian language.

So through Intourist I eventually got a ticket and four or five of my colleagues came to see me off at the station and by that time I had accumulated a lot of books I’d been given, including two volumes, a rare edition of Pushkin which I’ve given to the university library here. So I had quite a lot of luggage and got on the train and at the border the Soviet border guards came on board, nobody from Finland, and asked to see my passport, very politely. I showed them the passport and then they asked to look inside my baggage and I opened one of my boxes and they fingered through books, flicking through the pages and my guess is they were looking for me carrying letters to foreigners abroad from relatives. But they didn’t
find anything and they asked for my wallet. I gave them my wallet and they left my compartment and went to, went away and course that was my most valuable thing, the passport and my wallet. And in my wallet I had some addresses of East Germans to whom I had been asked to send money – no, West Germans – by some East German scientists on the ship, they couldn’t get money abroad to give presents to their relatives. And so they’d given me money and said would I… And so I’d got the name and address of their West German relatives and that I was a little afraid of having, so I didn’t want to leave them with the wallet very long while they were contemplating these things so after a few minutes I walked along the corridor to look for them and I surprised them by coming round the corner by the loo because they were looking at my wallet and pulling things out. And so knowing that I wasn’t going to get anywhere by demanding, I said very politely, ‘Could I have my wallet back please?’ in Russian, and they said yes and gave it to me. So that was the only slightly hairy moment, but I wasn’t carrying any letters and of course the money, money I’d had from before, it was the address of these West Germans, which really should not have been and probably wouldn’t have been particularly sensitive, although if they traced it back to the East Germans who’d given me the money that could cause trouble, but they didn’t. So, went on to Leningrad [Helsinki] and that was enormous, going into fresh air, to get off the train and to not ask who you were, where you were, what you wanted to do, just get a taxi, you off. It was tremendous relief from a year and a half of acting within the rules. And I did, I spent a few days with Valter Schytt and then came home on a ferry to, I don’t remember, Newcastle or Tilbury, got home and that was a lovely homecoming. Had another honeymoon. We had several honeymoons in our time from my homecomings.

Do you remember the moment of returning home and seeing your family after…

Yes, they met me on the station at Cambridge. Can imagine, a great thrill.

[0:06:43]

And your job started how soon after that?

Well, being a sort of university job, nobody, I mean I didn’t have to ask for leave, was simply trusted to go to work when I was ready to go to work. So I only took a few days off and then went to the Scott Polar and I wasn’t told to do anything, I was given complete freedom and
so I was immediately put in charge of the one glaciologist, BAS glaciologist who was already in the Antarctic or about to go to the Antarctic. They’d, I think it was about the first glaciologist they’ve had, and he hadn’t… I think, I forget whether he’d gone before I came into the job or not, but anyway, I was immediately automatically in charge of him, I knew him. And so then I wanted to build up a staff so I knew from my long experience of my own inadequacy that I wanted a physicist and a chemist who would later, who I would aim to make permanent staff because there was permanent staff in glaciology – well there was no glaciology except for this one chap who was already there, and no plans to have more. Geology was flourishing because they had, they were headquartered in the University of Birmingham and they had, oh quite probably eight geologists at work because Vivian Fuchs was a geologist, he’d travelled with Ray Adie before the war – no, after the war, 1947 in the Antarctic, they shared a tent for months, and they’re both geologists. And so they could both understand geology and not the need for glaciology. To a geologist, although they would claim that ice is a mineral, which it is, it’s not a mineral that geologists automatically take an interest in and… but I was taken on specifically to develop a glaciology programme.

[0:09:34]
So there was a lot of work to write justifications for having a physicist and a chemist. And I got the chemist first from the University of Bristol where… well I think I advertised in Nature or somewhere for somebody to work on snow chemistry, and this chap volunteered and he had a PhD from Bristol which was to do with mercury and he described at some time how in handling his mercury – it wasn’t realised at that time how dangerous it was – all his fingers had turned black and he sort of washed it off but didn’t feel any problem, but that wasn’t mercury poisoning, it didn’t have any effect, but it horrifies any current generation dealing with mercury to think that you were touching the stuff. And he took a long time to get going, but after twenty years he was one of the world’s top chemists on impurities in snow, industrial impurities principally, and that was interesting in terms of the worldwide dispersal of industrial pollution. The Americans have an industrial pollution lab right at the South Pole, the argument being that if the South Pole is getting dirty, then the whole world is, it’s spread all over. It’s the cleanest place in the world and they have a building they’re sucking in air from above the roof through several chemical analysis instruments specialising in different things. And so that’s what I wanted him for, because one of the ways of studying snow strata in the Antarctic was by its chemistry because for quite a few years, I suppose twenty-five years, the most useful reference horizons in an ice core were the bomb test horizons, radioactive snow and we knew when the bomb test had been done, the biggest
collection was Russian dirty bombs tested. So it was widely known because it had been recorded in, well in the atmosphere of every country round the world, but to have it in snow we realised, what a lovely thing to have a reference horizon of known date. And so in measuring the rate of snow accumulation you could travel around, either dig a hole or drill a hole, take up cores and afterwards wherever you had your radiation counter, determine how deep this, these bomb tests were and therefore that gave you the annual accumulation since. And there were a lot of other chemicals people were interested in, what was long life and it was discovered that DDT doesn’t change, it simply sits there forever and that’s one of the things that’s made it unpopular, it doesn’t disintegrate. So, that’s one of the elements and other industrial elements including lead, which of course people were realising at that time was coming out of motorcar exhausts and going all over the world and that didn’t… and that, if it disappeared into the sea nobody knew it, but in the Antarctic ice sheet it was recorded, we could find how much lead there was.

So he was doing all that and then I wanted a geophysicist to work on radar sounding which was just beginning at that time. Because as soon as I got back to the Scott Polar I heard about this, what is now called radar, was called radio echo sounding. Now the reason for the distinction – Americans call it radar – is that the word radar is compiled from Radio Direction And Reflection, or something like that, yes that sounds reasonable, but hanging aerials under an aeroplane you don’t know where the reflection is coming from. You don’t much care because the nearest place is down below you, but radar as developed in the war was for getting the distance and direction of invading aircraft, so that’s why it’s called radar. So Stan Evans who developed it at the Institute thought well it’s not really radar, we don’t know what direction, so he called it radio echo sounding. But the Americans and now a lot of people take the short version and call it radar, high step radar. So that was just developing, it was a great thrill and we were a very small staff at the Institute so we all wanted to use it. And Gordon Robin took it to Ellesmere Island with Stan Evans, the man who’d made the instrument, and Canadian government collaboration to provide an aircraft, and was a great thrill because they were able to sound on Ellesmere Island and Geoffrey Hattersley-Smith who had introduced me to the Oxford Exploration Club way back in ’47, he was in the Defence Research Board in Ottawa and this was – how many years later – this was 1965 so it was a good many years later, ’47 to ’65, we still knew each other. He’d arranged with Gordon Robin to provide, he’d provide an aircraft and if the Scott Polar put their instrument in. So I immediately realised how valuable this would be in the Antarctic and so I
said can I take it to the Antarctic, very same instrument that they’d used in Ellesmere Island, and since they had no other plans for it I took it and arranged with BAS to employ one electronic man because I don’t know electronics, and the recording mechanism, and to operate it in the aircraft and because it was my first season – this is ‘66/67 season – with BAS, and BAS was a very closed community; you were nobody if you hadn’t been brought up through the system, wintering in the Antarctic, and I wanted to understand the workings, the ethos of the organisation, so I chose to go by ship, which takes quite a long time, in the first season so I could get to know people and how they worked and talked to them all about how life was. And David Petrie came with me I think and BAS had one single-engine Otter – no, two at the time – but one of them had just crashed, well got lost and landed and it was hair-raising because they didn’t have enough survival gear and it caused a great scandal. They all got away with their lives, they were picked up by the other one. But that having been accomplished and that Otter having been abandoned on the Graham Land plateau which is still sitting, now buried in snow, we only had one aircraft and that was being used for supplying geological dog sledge parties at various places, to taking supplies out and taking rocks back from them. And so there was competition for it but I was official and I realised that it’s a collaborative effort and didn’t want to upset any apple carts because the geologists were relying on it, so I knew that, and so we did joint flights using the Otter to take out supplies to the geologists at the same time as doing radar sounding, and that worked fine. And so I got a number of very good records there although it took us time to get everything working, recording was the principal difficulty and had to be developed because it was film.

And so I was to fly home as soon as I got to Punta Arenas in Chile, was to fly home. But naturally, having all these American contacts, I called in to the National Science Foundation in Washington where the chief scientist was a glaciologist and an old friend, and I showed him these records, continuous cross-section. Well he’d spent years in the Antarctic doing seismic sounding; one sounding every thirty miles, and of course he was thrilled, as I was. I mean here we’d got a continuous sounding. So he said, won’t you come with us the following season, we’ll give you an aircraft, you bring on your instrument and put it in our aircraft. And of course I jumped at that and said yes, yes, yes, yes, yes, knowing that as a joint project our contribution would be worth less than one per cent of the cost to them, and they knew that, but it was the only way of getting the work done because they didn’t have the instrument. It was some years before they bothered to get it. And so Gordon Robin had corresponded with Crary but hadn’t decided on anything because they were rather suspicious
of each other and it meant collaborating with a foreign institution. But I was, I was… much more worldly than most people, than Gordon Robin, and I was very happy to work with foreigners. Yeah, we’d both been on the Norwegian-British-Swedish Expedition. So that was easily agreed between Robin and Crary and me that we should go down the following season, be given a Super Constellation four-engine airliner, in fact the first airliner to regularly cross the Atlantic with flight crew, and we could have it for a month. So we duly went to McMurdo and used it for a month. But that’s got off, I mean I was employed by the university with funding from BAS. The electronics man we took on for the Super Constellation was a BAS employee taken on specially for the task, and Gordon Robin was Director of the Scott Polar. So there were just the three of us and we could, therefore there was no bureaucracy in setting up this arrangement because there was virtually no cost involved for the Scott Polar, all the costs were the other side.

[0:24:18]

Who was the BAS employee who went with you?

Bev Smith – BME Smith. Beverley Ewen-Smith he called himself later, because all Smiths try to disguise their name by making it double-barrelled. So he eventually published things… oh, I know what it was, no he didn’t publish from that, that was his first season so he was sort of gobsmacked by the riches of the Americans going into Aladdin’s cave. He had just come out of university and being given a four-engine aircraft to play with was wonderful for all of us. And he was employed by BAS so that as soon as we came back from that he was working under me. So I sent him to the Antarctic the following season, rather a comedown because he was given a single-engine Otter instead of a four-engine airliner. But he did alright and brought back valuable work which in due course he published.

[0:25:57]

And so in oddments, in odd ways I was building up the staff and arguing that there was more and more to do and that I would like to have glaciologists wintering in the Antarctic, and gradually was given glaciologists, recruited them. It was at the expense to some extent of the geologists and I was subordinate to the chief geologist, but the chief geologist understood there was an argument for glaciology and so he was the chap who eventually handed over to me to be Head of Earth Sciences, which was geology, glaciology and geophysics. So we were good friends and he was helpful, but I was in Cambridge and he was in Birmingham
and I wasn’t asking permission for everything I did and I could talk to Sir Vivian Fuchs who frequently came into the Institute, so we all knew what was going on. So I gradually built up the numbers of glaciologists from there, but all the time I had to once a year go before NERC, which consisted of the university lecturers and professors, and be grilled ruthlessly, not that they thought they had very far to go in that I knew the glaciology and they didn’t, but they were all representing universities as well as NERC and they wanted our money to have more research students in their departments. So we were not sympathetically helped, but they knew the political background, that we were not going to be allowed to fail because of the political aspect. On the other hand, if it was discovered that our science was not good, they could make a big fuss about it, be nasty, because NERC, they represented in the country the Geological Survey, National Institute of Oceanography and several other national institutions, including Antarctic Survey. And so I was grilled once a year by them, which was not at all pleasant, but for one reason or another was always kept on and given my support. And the rest of the time I was totally in charge of designing the programme.

[0:29:25]

Of course I had to write arguments for NERC Council, but the programme I wrote and a few years after that, since we were the only people doing glaciology in the Antarctic Peninsula, I was asked to convene an international meeting to promote glaciology in the Peninsula, I did and I published that as a paper called *Glaciology for the Antarctic Peninsula Programme* [Polar Record Vol.17, No.106, 1974, p.86-98] – I can give you a copy of that – and that was good because I was all for international work to get more done. BAS, Fuchs was still afraid of foreigners. He was afraid of Americans because they would demand a higher standard of everything, so the idea of taking on Americans he didn’t really like, so he could understand me that I worked with anybody, but he resisted collaboration, but then he retired and so there was slightly more fertile soil. And having convened this meeting and produced a publication, a programme which I wrote, but it had been virtually agreed by this conference, then we had other nations wanting to work in the Antarctic. It took time to take it [phone ringing]…

[break in recording]

[0:31:31]
And we got Dick Laws to be Director. Well, he had not really done any international, significant international collaboration, although he had contacts in the world of biology, he was a seal biologist and an elephant biologist; he spent ten years in Africa working on elephants. But he was not in the way I… keen to work with anybody and I don’t put foreigners in a special character, I mean they’re individuals to me. And so the organisation as a whole had inherited from Fuchs suspicion of working with foreigners, because BAS has its very own way of working in that other Antarctic expeditions, particularly Americans, are paid extra for going to the Antarctic – hard lying allowance – but BAS people never have been because we’ve had enough people who are keen to do it as a sort of adventure before settling down to some dull office job. And the suspicion, working with foreigners, is they would demand higher payment and so on, but the collaboration I was interested in was not paying anybody’s salary but have their government support them to work with us collaboratively. And so it took time to get going, but as we had had this conference and I had published this programme, which was internationally agreed, gradually it took effect and very gradually we were able to work with – and this is not just glaciology and geology – we were able to work collaboratively and that just steadily improved all my time in collaboration. But every time I tried to organise joint fieldwork the staff at BAS raised all sorts of difficulties, all arising out of this belief that foreigners are different and require different handling, which I didn’t share, but it still took years to get going.

[0:34:32]

When you’re talking about the gradual improvement in that, are you talking between 1965 and say, 1974 when you became Head of Earth Sciences, or you’re talking about from 1965 all the way to retirement?

All the way to retirement, it was steadily improving. But you see, I had one woman surveyor on my staff, because survey mapping was under me as well, and didn’t think twice about it. And I had a geologist who had worked as a lab only assistant for Ray Adie in Birmingham but had not dreamed that she could ever go to the Antarctic. Well, she wanted to go to the Antarctic and I didn’t see why not. So the only way I could organise this was by – I don’t think I did organise it, I think she got an invitation out of the blue from the Americans, they knew our situation - inviting her to join them on a field party. And BAS was duly horrified – a woman in a field? Although the Americans had them by then.
What date is this?

That would be 1984 or 5, have to look up the exact date, but round about then. And so it was agreed that she should go and the Americans would look after all the logistics, so really we were just giving her time off. And… but as her employer she was not allowed to share a tent with a man, this was at the time horrifying thought that a woman should be sharing a tent with a man because anything could happen in the tent without supervision. Well of course the modern idea is, well let it happen. But then it wasn’t thought about. Actually, the Americans had suspicions as well, they became totally emancipated before that, but one of the first women that they had ever employed, they were just the same, a few years ahead of us, but very suspicious about the idea of women, a man and a woman went to the dry valleys west of McMurdo to do work and from other people who were around then, they said they seldom came out of their tent because they were too busy making love to each other. [laughs] So there was this suspicion of women and so my geologist, Janet Thomson, she was called, went with the Americans, had a wonderful time, but had to insist on a tent to herself because there were no other women, which is an awful bore and very unsociable anyway, but that was how it was done at the time so she could come home and say she hadn’t broken the BAS rules. Well, she had a marvellous time.

And so then I wanted to collaborate more with the Americans because they were working in places where we weren’t and they could get us there. And so we had, Janet Thomson came down the Peninsula on a summer only programme on a ship which doesn’t involve tenting with somebody. And so the idea was gradually sinking in that we should collaborate with other people and it slowly, slowly developed, but the idea of even in 1986 when I retired, no woman in the field was allowed to go as sole passenger in a BAS aircraft which only had one pilot, they only have… none of them have more than one pilot. And the almost unbelievable argument was that if the aeroplane had to go down, set down somewhere because of bad weather – they had plenty of survival equipment including a tent – but that would involve the pilot being in a tent [laughing] with a woman to whom he was not married. It sounds absurd, but I’ve written that all up in Forty Years on Ice. And gradually that was very quickly eroded after I retired because my successor was a woman as Head of Glaciology or Earth
Sciences, I forget which. But she said that’s preposterous that you’re going to prevent me sharing a tent with a man. And the rules were not changed but she went into the field and changed them herself and just didn’t talk about it. And so it became accepted and now there’s no distinction, we have wintering women in the Antarctic and again, wintering was horrifying because what fun you could get up to wintering with a lovely girl with nobody supervising. Well the answer is you can. BAS gets over this by the fact they probably wouldn’t allow you to share a cabin with a woman, whereas to the Americans it was no big deal. When I worked – and this is way after I retired, 1988/89 - for the Americans at the South Pole, I saw a man and a woman disappearing into a cabin by themselves and I asked the boss, he was called the Station Manager, ‘Is this allowed?’, and he said, ‘Oh yes, if they come and ask me if they can move in to a spare cabin together, shack up together, I see no reason why they shouldn’t, that’s their problem’. So out of something like sixty people at the South Pole, there were two or three who were shackled up with a woman to whom they were not married, but it was their business, that’s the American attitude, it’s their business. Same as you and I can have a girlfriend if we’re not married and sleep with them, it’s your business. You can’t because you’re still married. And so I lived through all this stages of the emancipation of women. It was a slow business and BAS was about the slowest, but it was because of Fuchs. Fuchs had said I’m never going to have women in the Antarctic because I don’t think they’re up to it. Well, I’ve discovered working, I’m with the Americans. When I worked ‘88/89, when I was working at the South Pole, they were just people, not male or female, just people doing their job and they were very, very tough. No, they weren’t tough, they were still very female but they had come there on the understanding that they would do anything required of them and this was to get over the residual male prejudice, and they’d agreed to that, they’d do anything. And I think I mention in Alien in Antarctica that the woman I tented with had been asked at the South Pole to dig with a hand shovel a hundred yard trench between two buildings by hand, by herself when there were mechanical diggers around. But there was good reason and that is that there were cables buried and by digging the trench by hand you would probably not cut the cables. But you and I would think instinctively that if we’re introducing women to the Antarctic, you would not take them up to 9,000 feet above sea level and miserably cold climate and tell them to dig a trench when there were many, many men on the station who could dig a trench. But when I challenged her about it, she said, ‘Well, that’s what I agreed to, I came here to do what I was told’. And so women have proved themselves completely now and it’s the same with BAS I’m sure, now, but it just took time.
Could you say more about Fuchs then? When you first started at BAS in the mid sixties, could you expand more on his influence on the organisation?

Well he ruled it, but in a very nice way. It’s just that things like this, that his prejudices controlled everything because he was the boss, in the way that Shackleton was referred to as the boss by his crew. He was the boss and you didn’t cross him. It’s not that he’d be angry, but he just wouldn’t allow you to do anything against his rules. He was a very nice chap and I always got on very well with him. He came into the Scott Polar about once a week, usually to see Brian Roberts who was the Antarctic desk at the Foreign Office half-time and half-time in Cambridge. But since I was in the same building he would come and see me and I never had any problem with him, he was a nice chap, but I knew what he thought about the way things should be done. I mean he objected for a long time to having two-man cabins in Antarctic station. Why? Why? On the grounds that it might shield buggery or something. Just looking at the pessimistic side of everything. I’m guessing there, we never spoke about it. But what BAS instinctively had done up to the time that it became inevitable that people wanted a higher standard, is have bunk rooms, and on the summer stations where I’d stayed in doing my radio echo sounding, the bunk rooms had eight or ten people in and no women so even buggery would have been difficult. [laughs] But course the assumption everywhere that men can’t go without sex and if they’re required to go without sex there’s homosexuality, and of course in some communities like the military there probably is. But it’s not something that bothers me, I mean that’s a private affair. But that was all at back of it, is that you should be communal and chummy and living close to one another and it was, the atmosphere was always very nice on BAS stations.

When did Fuchs retire? Approximately?

I think, I think… round about 1980. I would have to look it up.

So after you became Head of Earth Sciences?

… I think so. It’s in Forty Years on Ice, I would imagine, when he took over.
So his influence was there for almost all of your time at BAS?

Yes. It was and he was anti-women, not quite as vehemently as anti-women as Fuchs, but nevertheless BAS policy was still no women in the Antarctic. And that’s why the only way I could break this taboo was by getting Janet Thomson to go as a guest of the Americans, and that was the start of the erosion of this absurdity.

[0:50:05]

And the reluctance to work with other countries – can you expand on that, where that came from and why?

That BAS had its own team ethos and way of doing things derived from pre-war university expeditions, both Oxford and Cambridge, it was before there were exploration societies in other universities, and the 1935-37 or 34-37 British Graham Land Expedition was largely peopled by people who’d been on university expeditions to Greenland. And so the traditions all were handed down and there was a way of doing things and people didn’t continually demand higher standards of living, which Americans would automatically, instinctively. So any Americans working with BAS thought our conditions were primitive. We didn’t because enthusiasm for doing the job was uppermost in our minds and we took things as they came. One very successful exchange was the Russian who exchanged with me while I was at Novolazarevskaya, Garik Grikurov. He thoroughly enjoyed his year with BAS. He was a geologist and he was working with geologists and they liked him because he was easy going, easy to talk to about anything. He regularly revealed about life in the Soviet Union and it was a tremendous weight off his mind to not be surrounded by people who were going to report on what he said, so he had a good time, so that exchange went very well.

[0:52:39]

What did Fuchs think of that, the exchange programme?

He didn’t want to do it because he didn’t want to pay me for not doing any work for eighteen months. And so he put up quite a battle, but Gordon Robin was on my side and the Royal
Society were on my side. That’s all in the appendix to *Vodka on Ice*. And so he was eventually worn down by Gordon Robin I think, who would have said really, we must do some glaciology and Swithinbank who was still in Michigan at the time, but wants to go with the Russians, is somebody I trust because I’ve lived with him for two years, and so that’s how it came about, mutual interest. I wanted to go with the Russians, it couldn’t be arranged through the Americans because they said you’re not American, and I had not only done my individual correspondence with the Russians, I had the Royal Society and the Scott Polar both working on my behalf to try and arrange this exchange, and they succeeded in the end. But the news came by a telegram to me from Shumsky I think – I’ve got all the records – saying you’re to meet the ship at Le Havre on the third of December, which was only weeks ahead. Of course I replied and said well, what equipment have they got and my work and so on. No reply.

[0:54:48]

> *When you started, why is it that BAS only had one glaciologist and there was presumably a lack of a glaciological research programme because Gordon Robin was asking you to set one up?*

Yes.

*And that was 1965 – why is that?*

Because both Fuchs and Adie were geologists and BAS had begun with meteorology. You see it was originally a wartime operation to check on whether the Germans were using Deception Island for refuelling or whether the Argentines and Chileans, not being involved in the war, were trying to get a step ahead of us. So that dual purpose.

*They were both geologists…*

Yes, and geology and survey, I mean it was obvious that there’s more rock in the Peninsula, Antarctic Peninsula, than almost anywhere else. Well, the other side there’s a lot of rock, but it was very rugged, very difficult to travel in and so systematically Fuchs was putting wintering bases further and further south with the idea they would do all the geology in the
vicinity by climbing up all the mountains. So in principle that’s what he was doing and since he was a geologist, glaciology was something he didn’t think of. This is you could say quite natural because his world was geology and Adie was willingly working under him as Head of Earth Sciences.

So something, the ice was therefore almost a nuisance, something to cross to get to the rock rather than being something of interest in itself?

Yes.

[0:57:12]

It took a long time for glaciology to, I suppose, come into BAS given that the Journal of Glaciology was going after the war. I know it was very new then, but that’s quite a lot, that’s twenty years to actually get established at BAS isn’t it?

Yeah, the only reason I can see for that is they didn’t have people wanting to do glaciology. They were routinely taking on geologists because there was geology to do and because Fuchs and Adie both understood geology. So I don’t think it was a strong aversion, it was simply why bother when you’re getting on with something you believe is very important, geology. Remember, the glaciology was only very much at the beginning in my time. I mean the, what became the International Glaciological Society and now has this much more shelf space of its journals in the last seventy, sixty years, was a tiny group of enthusiasts, including Max Perutz and a few other people. And I used to attend all their meetings, which were where the founder, Gerald Seligman, lived in Kent and then later in London and there were lecture meetings, discussion meetings, but there were probably thirty people there. Well this is the foundation of a science that probably has well over a thousand employees today, worldwide. So it was very much the beginning and relied on enthusiasts.

So you recruited the chemist from Bristol…

And then a physicist.

[0:59:36]
And who was the physicist?

The physicist was Christopher Doake – D-O-A-K-E – and you couldn’t advertise for glaciologists because there weren’t such things, so I advertised for a physicist to work on the, probably the interpretation of radio echo sounding, that’s what I wanted him for initially, but I also wanted him to bring physics to bear on glaciology. He had a PhD on low temperature science and when I said ah, that’s wonderful, he said, well I mean low temperature, minus 270 degrees Celsius. [laughs] But he was keen on a change. He was working for Xerox Corporation and was keen on a change, he thought that would be better for his… thought Xerox was a dead end and I was offering something totally new in which he would have a lot of freedom to develop his own programmes. And when he came to me I said something to him which is totally unfashionable these days, I said we’ll start you on radio echo sounding, but then I want you to choose what you believe should be done in glaciology and pursue it. And nowadays that would be considered an awful thing to say because nowadays you much more do what you’re told, or shall we say, you’ve got to produce reams of paper to justify what you’re doing. But university scientists for generations have been left to get on with what they’re interested in and I thought this would be good and he was happy with that, very happy with that, given that freedom. And… but gradually… the present staff would be horrified that somebody had been taken on with those terms.

What did he choose to do with that freedom?

Well he started on radio echo sounding for several years, because there was a great deal to do, still is. And then physics of ice flow and the radio echo sounding eventually responding to the glaciology of the Antarctic Peninsula Programme – remind me to give you a copy of that. It was agreed that one of the most exciting things being done both in Greenland and the Antarctic was ice coring for study of palaeoclimate and still is a marvellous thing and there have been many, many drill holes to bedrock up to now, not only in Greenland and the Antarctic, but all through South America. And so that was clear at that time that that was a coming thing, although the Antarctic being very large and not knowing the ice thickness of most of it, it was clear that radio echo sounding was going to continue. But I was preparing slowly for my own retirement, in 1986, and I wanted people to show initiative. It’s no good suddenly disappearing from a group who are doing exactly what they’re told by their boss, I
wanted academics running the thing. And so both David Peel the chemist and Chris Doake
the physicist were delighted to be given that freedom and I never regretted it because they
justified their existence. But then Doake as… I think, well yeah, he was always working
under me until I retired, but I didn’t see it that way, he was independent, getting on with his
job. We discussed what to do and I had to arrange the logistics for him to get his people on a
ship to get them in an aeroplane and get their equipment and so on. So he wasn’t Chief
Glaciologist, but didn’t need to be because he was running his own programme and when I
eventually retired in 1986 we advertised the job and the woman who’d been, I knew, trying
to come into BAS to work as a glaciologist for ten or fifteen years, she was a good friend but
she knew it was just not on, she applied for Head of Earth Sciences, my job, and she got it
and she carried on working with Doake. I don’t know if she ever made him Chief
Glaciologist, but since she was interested in glaciology herself they would have worked
together well and she too has retired at age sixty now and there’s somebody else doing it.
But the whole organisation hierarchy structure of BAS has been changed recently and I’m
not up to date with it.

[1:06:27]

*When did Doake start doing work then on cores, drilling cores for palaeoclimate research?*

While I was still in business I borrowed an American drill. We didn’t have any drills that
could go beyond ten metres and I knew the National Science Foundation was working with
drilling at both shallow and deep cores and since I had lots of friends there I wrote and said
might it be possible to borrow one of your drills. And this was a drill designed to go, I don’t
know, with this hundred metres or more or less, I forget. Anyway, we borrowed it and one of
my people dropped it down the hole, in other words, lost it. And this would be a good few
thousand pounds, and as a friend I immediately wrote and said we’ll pay for its replacement
and they wrote back and said, don’t bother. So that’s what happens with friendly relations.

*When was that then, do you think that he started using that borrowed drill?*

Again, these are not exact dates, but it would have been in the eighties, first half of the
eighties.
And could you please tell me more about, starting with when you started it, more about Peel’s work on the chemistry of ice. So when did he, what did he do and when really?

He was developing progressively cleaner ways of sampling ice. The contamination in the cleanest place in the world is so small that you need very, very sophisticated instruments to detect it and the less there is, the more risk there is of contamination, as a tiny amount of contamination ruins your argument, that it’s not coming from the Antarctic, it’s what you’ve done since. And so he had to develop cleaner and cleaner methods of collecting and he started by going down and drilling pits that I would have done, but taking up cubes of snow like this and packing them into insulated boxes, being very careful to be… to be… hygienic, whatever the medical school hygienic…

And that’s about half a metre cubed isn’t it, yeah?

Yes. Handling everything with clothing that’s been washed and boiled, implements that have been sterilised, everything possible before packing it away in aluminium boxes and bringing it home. And then what he did too, you then progressively discard the outside on the assumption that it’s got contaminated and take samples as you go in and you find your, the chemical you’re looking for as you go in the core progressively decreases in amount, all this being contamination from outside while the blocks were coming home, or when you unload them in the lab, and finally when you get to the middle of the core the values stay the same, you can then believe that you are getting the true values of uncontaminated Antarctic snow. And this was very, very difficult because it was so easy to contaminate. And how did we know… you didn’t know whether you were contaminating it or not, but you publish the results. And other people, there was noticeably a Belgian chemist called Picciotto, an Italian name but a Belgian chemist, who had [coughs], who was doing the same thing, was a bit ahead of us, but were slowly, other people thought this was very exciting because what Picciotto was doing was being able to measure annual accumulation in areas where it was as little as seven centimetres, even three centimetres a year, by changing seasonal patterns and also contamination, industrial contamination. So this was clearly very interesting and he was the one who had followed the radioactive layers as they got buried. So he published and we published and although they were in different places, the discrepancy, disagreement between
the two was more than you expect because the air is getting mixed all round the Antarctic and you would expect to get comparable results because of the amount of mixing. So the assumption was that one of them was getting contaminated and I didn’t follow it because I knew he was doing his level best on this, but gradually, other people in other countries had the same thing, that their samples were approaching a common mean value. In other works, that we were getting the contamination licked. And David Peel was – took him twenty years – but he was in the forefront of that and has been since Picciotto retired. He’s retired, David Peel retired a few years ago now.

[1:13:52]

And where did the idea come from that you could use Antarctic ice as a kind of litmus paper to test world pollution or to test contaminates?

Well, people were getting very worried about the distribution of toxic chemicals. And DTT was found in Antarctic penguins, a colleague of mine found it. And that was a horror because it was an awful long way from the source of the DDT, and it’s a very persistent chemical, it still is, that’s why it was forbidden. And this was an indication that nowhere is safe, that pollution can be taken either by atmosphere or sea or people, or things you import into the Antarctic, can all be brought in by people and this is alarming when it comes to potentially dangerous chemicals, particularly wildlife ingesting your DDT, which by then was a known poison so it rang lots of alarm bells when it was found in penguins. But my interest, the glaciology interest, was in using the, partly in using the chemicals, the contamination as a reference horizon and partly through increasing global interest in the spread of industrial pollution and knowing what the spread is. I mean if you want to measure industrial pollution the best place would be to go a mile downwind of the nearest factory, you’ll find plenty of it. But that is, you can’t conclude anything in terms of worldwide distribution from that. To go to the middle of the Antarctic, what you find there is global. So this… again, I mean glaciology leads to lots of things like this and you… I was interested in just development of the subject, anything that we could learn that was worth learning, which is what academics are usually interested in.

[1:16:49]
From 1965 onwards then, you’ve taken on Doake and Peel, did you take any other staff on?

Yes, slowly. They… I made them section heads, or one of snow chemistry and the other of ice physics I think. And then I took on a third, also a physicist, called Julian Paren who I’d known at the Scott Polar, he’d done his PhD at the Scott Polar, physicist, because there was so much more to be done. And he turned out to be less of a success in that he eventually came to lack self-assurance, that is self-assurance that he was doing something vital, something, valuable science. So before I eased him out he resigned. He realised that he was not getting anywhere, not getting any satisfaction out of it. But he enjoyed working with BAS and so he became, he said could I move to the other side of the building, which was into administration, and there was a job going as Assistant to the Director – we’d never had an Assistant to the Director before – an Assistant to the Director who was a scientist could do more than an assistant who wasn’t in science. And so he became Director’s Assistant and stayed at that until he retired. And he had a crisis of self-confidence, feeling that he wasn’t achieving enough in glaciology. And I think it was right, he wasn’t as self-motivated as the others.

[1:19:10]

What was he… what sort of science was he attempting to do?

Ice drilling, to get ice cores to study climate change and he was the one who dropped the American drill down the hole and lost it. He was trying hard. And we wanted to study the change in annual accumulation as you went down which reflects climatic change and although the most exciting cores are done first in Greenland and in the Antarctic well away from the coast, we quickly realised that the story in the middle of the Antarctic may not be the same story as near the periphery and that we couldn’t compete with the chaps working on ice cores in the middle of the Antarctic but we could produce, we could work on ice cores within an accessible distance from our stations, within our Twin Otter range where we could take a drill out. And so besides the ice coring, just about that time we were beginning hot water drilling in ice shelves as being in some ways easier than coring and we wanted access to the water under an ice shelf to see the temperature structure, that is to say, was the temperature structure such that it might make the ice unstable, which it does, and have whole ice shelves go out to sea, which they have done since I retired. They were beginning when I
was still there, and that is water temperature; warm water coming in from the Continental Shelf. So that became part of the story. Again, what I always wanted is enthusiasm, the glaciologists to get enthusiastic about a particular subject. And we’d very quickly notice if they were not producing publishable results. But you do far better if you’re enthusiastic and you’re not a clock watcher. And they were all married and in other professions for young people there’s such a tendency to be a clock watcher and five o’clock, up sticks and go home, whereas enthusiasm for the job had always guided me. So that’s what was happening. So he was less interested than me or Doake in the science or didn’t feel that he could make a competent enough contribution, so that’s why he went out. And then gradually Doake took on a mathematical modeller, which was very fashionable and still is, modelling the Antarctic ice sheet, and so the normal contract people who work for up to five years, which people at BAS involved… involved… [pause] Lost my thread there for a moment.

That’s okay.

[end of track 13]
Okay, we’re staying with the period from 1965 to 1986 when you retired, today and then beyond that in terms of satellite work. Could I start by just asking a few additional questions about the radio echo sounding project? And what I’d like to know if possible is the history of the machine itself. I know that over the period there were various different kinds of machines as they were revised and new models built by different people. I wondered whether you could start with the first machine that was used at BAS, which was the one made by Stan Evans?

Yes, it was a Scott Polar design. Gordon Robin got hold of Stan Evans who at the time was working in the engineering department in Cambridge and he’s long since retired and there was no such thing as a radio echo or radar sounder – the Americans call them radar sounders – there was a reason why we called them radio echo, because it’s not exactly radar but everybody recognises radar sounding these days. And said we got the idea from an American who had accidentally found that ice was transparent to certain radio frequencies, whereas physicists up to then had thought that ice was opaque to radio frequencies. And this American had discovered quite by accident talking on a VHF radio between one side of an iceberg and another that he was communicating whereas VHF is supposed to be a straight line. And so we had the idea and Gordon Robin very eagerly took it up because of course the idea of measuring ice thickness in the polar regions without spending twenty-four hours getting a single depth was extremely attractive. And so Stan Evans from first principles as a physicist, he had worked at Jodrell Bank before coming to Cambridge and he was just a good physicist and he designed this equipment which was very crude, very primitive, but worked. And he and Gordon Robin flew to Ellesmere Island in the Artic courtesy of the Canadian Defence Research Board who I had worked for on the ice atlas and again, coming back to Geoffrey Hattersley-Smith who had got me into the Oxford Exploration Club in 1947, he was working for the Canadians, he arranged for an Otter aircraft to carry the aerials under the wing and go to Ellesmere Island where there’s a lot of ice within Canada and that was very successful. And as soon as they got home, I had only just got working with BAS after being with the Russians, I said well, could I take this same instrument to the Antarctic, because it was during the northern winter, southern summer, and Gordon Robin said yes. And so I did and made exactly the same arrangements as they had with one of our single engine Otters, put aerials under the wings, and we flew that first season and that, as I think I related earlier,
was on the way back from the Antarctic I went to visit my old friend who was head of the right department at National Science Foundation in Washington and a very accomplished seismic sounding; one sounding thirty miles, another sounding, and had made pioneering journeys during the International Geophysical Year. And showed him my results, which was continuous cross-section of the ice sheet, and of course he was thrilled. And he said, oh come back with us, we’ll give you – first I think he offered a DC3 and then he upped it to a four-engine Super Constellation so that we would have a longer range - he said we’ll give you a month with this aircraft, do what you like with it, just bring your instrument, and that was the beginning of a long story.

[0:05:14]

Was that the same instrument that you took to use with the Americans?

Improved. Because we had twelve months to improve it and so it was… it was… the same principles but steadily improving and the recording system was improving. We had two cameras continuously running so that if one of them jammed or needed a film change we would be covered by the other, so we had continuous recording. But it was just improved, but improved by Stan Evans and he actually came to Christchurch to fit up the system in the Constellation, but for some reason I haven’t established, didn’t want to come with us to the Antarctic, so that the Antarctic crew was Gordon Robin, me, an electronic technician employed by BAS, although he worked at the Scott Polar, called Bev Smith, and he was very, very clever at electronics. So there were just the three of us.

[0:06:40]

And how many seasons was that echo sounder used by American aircraft? That one?

That one season and then they offered a Hercules ski aircraft, which was the standard, whereas the Constellation only had wheels and they were nervous that if McMurdo was sucked in under cloud or fog when we came back from a twelve hour flight, what would we do then. Well I knew what I would do and I related it in my first book, and that is fly to areas that I’d seen in the Transantarctic Mountains where there was bare ice and we would have put the thing down and camped and waited for help or better weather. But their orders were
that they were to crash on the Ross Ice Shelf which is something that you’d probably get away with your lives but you’d write off the aircraft. I thought that was silly, so that was the origin of my interest in landing big aircraft on ice. But they were nervous and therefore Hercules is much better because having skis you could land anywhere.

Did the Americans at some point build their own echo sounder so that…

Not for years and years after that, it was a Scott Polar sounder for the first few years and then the technical university of Denmark, there was a very clever man came in with collaborating. I think part of the instrument may have been his design, but he was collaborating with the Institute and therefore with the National Science Foundation, and that went on for some years until the Americans – and I got reports of this because I’ve got so many friends in America – became envious and said well why are we giving away all this flight time to those Brits instead of doing it ourselves, because there was nothing secret about the design, we told anybody who wanted how to… we wanted it to be used. And the Americans got to the National Science Foundation and said we shouldn’t be giving away this wonderful science to the Brits and the Danes and so that stopped it for a time and because of the great expense of flying many hours in a Hercules, the thing virtually died then, but the Americans have excelled in making small, even backpack versions, for use on glaciers in temperate regions but they never really got back to long range flying in the Antarctic.

When did it die, when you said that they…?

I would have to look that up, but let us say seven… ’78, at the end of ’78 when I was down working on the Byrd Glacier I did get a ride and by then there was a new Director in the Scott Polar, David Drewry, and he was down using the Hercules and so it would have been within a year or two of 1979 that it would have petered out.

[0:10:40]

In terms of the Scott Polar machine, Stan Evans made the first one and then improved upon it – did anyone else come in and make a new Scott Polar machine?
No, I don’t think they did, but you can always improve something like that, so it was a matter of steady development but it was essentially the same thing. And I mean the first ones we used were projecting the image of an oscilloscope on to a moving film. Well, inevitably of course that became digital and is now all recorded digitally, there’s no film of it although you can make a film of it. And so things like that were just the normal developments, the way things were going at the time for anybody who was keeping up with contemporary electronics, change from film to digital.

[0:11:49]

At one point in Forty Years on Ice there’s a man called Hugh McPherson, an electronics engineer mentioned, I wonder what role he had in developing this?

He was our technician employed by BAS as one of my team when I think I was still at the Scott Polar at the time. And he was taken on, a Scotsman, he had worked for one of the big radio firms I think, taken on and so I gave him free hand, I just said there’s always improvements can be done, get on with it, which is rather my way of working. And then he came to the Antarctic one season when we fitted the steadily improving system in a Twin Otter – by then a Twin Otter with better aerials – and flew a lot and that’s where we made some interesting geographical discoveries about the extent of the ice shelves south of the Antarctic Peninsula, and he was involved with that and when we discovered this nunatak in the middle of nowhere, which turned out to have very ancient rocks in it, he was there. But he was not excited about the discovery aspect of flying over the Antarctic, he was strictly electronics and that’s where his mind worked, and he didn’t want to come on any more fieldwork so he only did one season.

[0:13:38]

Do you remember precisely what improvements he made to the machine?

No.

But when you said that it had better aerials on that particular trip, what made them better?
I think with a Twin Otter they could be put further below the wing and still using the wing as a reflector, but I don’t know enough electronics to say why they were improved.

[0:14:13]

Was there in any sense a separate SPRI and BAS echo sounding project?

Only after I left, after I left the programme which is when I had moved to BAS and David Drewry was Director of the Scott Polar, we were separated at that stage, but both developing from the original model.

Why do you think it separated at that stage?

Oh, simply because there were two institutions wanting to go their own way and the Scott Polar had the arrangement that I’d been involved in setting up with the Americans and the Americans didn’t mind that the Scott Polar had changed its Director and so kept on working with the Scott Polar, whereas in BAS we only had Twin Otter aircraft and therefore we had to use those and so BAS developed their own and has continued to use their own and steady improvements in the last thirty years.

Did your view of how the echo sounder should be used and where, differ from other people either at BAS or at Scott Polar?

No, we all wanted to use it on ice sheets because the unknown then was how thick the big ice sheets are, and so exploring the bedrock underneath, what the continent looks like if you took the ice off, everybody agreed that was number one priority. But who did what was decided on what aircraft we had and the range of the aircraft and a Twin Otter is much shorter range than a Hercules. So we were aiming for the same thing with whatever we could do.

[0:16:34]

I wondered whether others had different ideas about international co-operation in the use of it?
BAS was cagey, sensitive about international co-operation and this was tradition carried
down from Sir Vivian Fuchs who didn’t trust anybody else, thought we knew best how to do
everything, whereas I with my experience with the Americans was very ready to work with
any nationality I thought was competent to be involved with. And Dick Laws, when he took
over from Sir Vivian Fuchs, had inherited this suspicion of foreigners and belief that our
science was better than anybody else’s and foreigners would be difficult to work with
because they wanted to be paid more, whereas BAS people were always paid, the standard
was what they might get at home with their equivalent age and experience, and no more,
whereas the Americans always paid more. And so to some extent we felt that the Americans
were a bit spoiled and I felt it less than other people because I had worked with them, but
standards are different. And so it took some time and… but I continued to get help from the
Americans because I knew people personally in the National Science Foundation and so
when I asked for fuel at their very remote Siple Station I asked for ten drums of fuel – for
nothing I may say – and they gave it to me as a friend, and that extended our range and
supported the work that we did down towards the, around the Ellsworth Mountains.

*To what extent was there any protectiveness over the technology which had been developed
by Scott Polar and therefore it was a British piece of equipment, to what extent was there any
sort of jealousy over results and technology in terms of sharing with the Americans?*

Gordon Robin did hog the scientific results early on and David Drewry continued in the same
vein, and although they had an American take part as a guest and he was invited to
Cambridge and spent at least six months in Cambridge being involved with the data
reduction, it was made so difficult – now I may be unjust in saying ‘made’ but it was very
difficult – and to get into the standard of electronics that the best SPRI people had involved
training and he got this American who wanted to use the results - he was a geomorphologist -
for studying the landscape under the ice, eventually gave up because he found it too
frustrating and nobody was particularly helping him. He was there because it was supposed
to be, well it was a joint programme with the Americans providing the aircraft, and he found
it so difficult that he went back to the States utterly frustrated and probably was instrumental,
for the best of reasons, in pointing out to the Americans that they were giving away a lot of
good science that they could do themselves.

[0:21:01]
What was Robin and what was Drewry worried about then in terms of sharing?

Both very ambitious scientists in their own right and ambitious scientists tend to be squirrels and to sit on their results and not want to share them with any other and they both had that in common. So whereas on the outside I felt or probably said that we’re willing to collaborate, in fact they were so keen on themselves publishing the plums that they either intentionally or unintentionally made it difficult for other people to get some of the plums.

Can you think of any example of those, of the plums, what were the scoops that they were jealous of?

Well, the whole collaboration with the Americans was aimed at measuring ice thickness all over Antarctica within the range of their long range aircraft, which in fact could only cover perhaps a third of the Antarctic and anyway, only run lawnmower parallel lines sixty miles apart. Well, anything can happen under the ice in sixty miles, you could have a sub-glacial mountain range that you would never discover, but you’ve got to begin somewhere and so to do a network like that was a very sensible way to go about it. What was…

I wondered what in particular they were keen not to share?

I think it was simply that – and I’ve met many of them in my career, very many - and it’s normal in science to find people jealousy guarding what they have discovered until they’ve published it and then they can relax and bathe in the glory of having published it, but this is I’m sure common in all branches of science.

Why did you not have that jealousy over results yourself?

Because I always wanted to get other people involved and to go further than I had and so I was lucky in that most of the experimental work I’ve done in the Antarctic, I was head of a small team and there was nobody competing with me, either then and there or afterwards. And there was later when I had measured the rate of movement of the big valley glaciers flowing into the Ross Ice Shelf, naturally I wanted to know the thickness of them. Well the only way to do it at that time, which is early sixties, was by gravity measurements. And so I
collaborated with Ed Thiel from the University of Wisconsin who was a geophysicist and very familiar with measuring gravity in different parts of the world, and that was, I invited him to come down and bring a couple of his people so that we could do gravity cross-sections of the glaciers that I’d measured the rate of movement of, and that was the 1961/62 season when Thiel was killed, he had a plane crash.

[0:25:15]

Thank you. Could I turn now to your social life while at BAS, so in the period ’65 up to retirement. If you could talk about sort of key friendships, social activities and relationships in that period?

Social life, well social life was, really revolved around polar colleagues, although my wife had her own social life and the two became to some extent intertwined. But there’s a very strong bond between people who’ve worked in the Antarctic because there are unique circumstances that other people don’t understand and so I can’t remember a lot about social life, but in the village my wife was really good at developing a social life, to which I got dragged in. No, that’s an unkind word, I was invited to share, which I did. And otherwise I suppose nose to the grindstone, there was a limited amount of social life that I had but I didn’t miss it.

Did BAS have sort of organised social activities?

No, BAS did not. There were friendships made and some out of hours socialising, but otherwise it was probably an annual meeting of the BAS Club, which is anybody who’s belonged to BAS, has an annual dinner. And the Antarctic Club, which has an annual dinner, and that’s about the only contact we had with people who had left the organisation. So we kept in touch and you keep in touch with the people who have most in common and I still am today.

What about Scott Polar, did they have a social scene of any kind or a club?

No. They were part of the community but somewhat separate from BAS. Scott Polar welcomed anybody coming in, including BAS. BAS was not so welcoming of Scott Polar. I
think they would probably deny that and say we had nothing against them, but it just worked as two separate organisations and the Scott Polar had a tradition of everybody having tea together and this was very good, so we knew what everybody else in the building was doing and that still continues, although there are some people who don’t communicate with other departments in the Scott Polar.

Was the tea every afternoon?

Every morning and every afternoon. Coffee in the morning, tea in the afternoon, and still is.

[0:29:03]

In terms of sort of off the record, informal discussions, what was Scott Polar’s view of BAS?

Envy at the amount of money they had and the fact that they could go where they wanted in the polar regions. Scott Polar has never had any of its own logistics, that is to say vehicles for travelling. They may have had a few tents and things, but totally rely on collaboration with people who have logistics who can get them around. And I think from the point of view of the Scott Polar this has been good, their science has had to be good enough to be invited by other people to come and work with them. The people who have a lot of logistics aircraft and ships and bases probably spend eighty or more per cent of their total income on logistics and science gets what’s left over, whereas in the Scott Polar it’s all science. So that’s a way of spinning out a small budget compared with a big budget like BAS, and it has worked, remarkably, that invitations have come from other organisations for Scott Polar people to work with them at no cost to the Scott Polar as guests. I’ve benefited enormously from that myself.

And in the other direction then, what was BAS’s view of Scott Polar?

As a tiny and perhaps… perhaps cruel to say, but irrelevant organisation, that was their view and it was of course never my view because I knew the strength of the Scott Polar. But we were and still are doing cataloguing of polar literature and there are several people involved in Scott Polar on cataloguing polar literature for the benefit of the whole world, and BAS was benefiting from that and for a good many years I think BAS gave us something like £40,000
a year to help this cataloguing, and that was nice, but I think they’ve cut it off now because they’re facing hard times.

So on what grounds then did they regard… you think that they may have regarded Scott Polar as irrelevant?

Well, there was not much science that Scott Polar was doing that was the same as they were doing. I mean Scott Polar has an anthropologist and quite a lively department of ethnology, anthropology, which was very far from anything that BAS did. So that was the separation. It was not in any way an excluding separation; you collaborate with people you have common interest.

Is there any sense in which BAS saw itself as being more modern then? Of its science being more modern?

Well, it did science in so many fields and does, that Scott Polar is not involved with and so to that extent they were in the lead and there was no competition and are respected internationally for what they do. So I mean Scott Polar is and was and always has been a tiny organisation compared with BAS.

[0:33:34]

Thank you. Over this period, sort of 1965-86, could you tell me about family life? Now that’s a very long period to talk about so I wondered whether you could start by telling me about any key changes in family life over that period or key events?

Well, my handicapped son had been born while I was with the Russians and when I came back from the Russians he was a year old. But my wife’s daughter who I had legally adopted as a stepdaughter was much older than the other two. First there was Carol born a year after we married while we were living in the States, in Michigan, she was born there, and then came to England when I organised the year and a half with the Russians and so we moved across the Atlantic when she was about one year old, before Kelvin was born and we were anxious to have another child while I was at home and able to take part. So I got Mary pregnant a second time and that would have been, I would have been almost home – no I
wouldn’t – but it would have been during my winter with the Russians that he was born, but in fact he was born premature, only, not much more than a month after I left the country. So I didn’t meet him until I came home in 1965. So here we were with an older daughter in secondary school, the younger daughter in primary school [coughs] and so bringing up a normal family. That’s about what was going on. We went on normal family holidays, very keen on camping, both of us, so we went all over Scotland and Wales camping during the summer. But otherwise a normal family life.

[0:36:25]

And your son, the arrangements you made for your son’s education?

Well my wonderful wife heard about the Camphill Rudolf Steiner schools who respect mentally handicapped people as much as they respect normal people and that movement was started by a German Jewish refugee who came in the 1930s to Scotland and set up this community of handicapped people with people who understood them and liked working with them. And Mary worked at getting involved in that and miraculously arranged – it was easier at the time than it is now – to get the state, the local authority to pay all the school fees for Kelvin to go to this Rudolf Steiner Camphill School west of Aberdeen, which is still going strong. And all fees paid, and he had normal school terms there for ten years until he was fifteen or sixteen. And then the idea was to come home to get reacquainted with the family, but of course he’d been at home through normal school holidays anyway, and then Mary heard about a new group home that was being set up in Cambridge, Cherry Hinton village, and since one of our social friends was a psychiatrist who was asked for advice on the people to begin this community with, he suggested Kelvin as being a good person and now, twenty-seven years later, he’s still in that community.

[0:38:54]

My regret is that he didn’t go to one of the Camphill villages, I think Botton is the most famous one, because there they earn just about half their keep in agriculture and handicrafts and things and are kept very busy and wonderful, friendly communities and there are now several of these villages run by Camphill Trust throughout the country. So my regret is that Mary wanted as a normal parent to see our son more at home and therefore by getting into this place in Cambridge, for which we are extremely grateful, didn’t realise how limiting it
would be, not intentionally, compared with a Camphill village where the residents are required, encouraged, to earn their living.

Have you suggested that he moves since then, since he first went?

No, it became too late because he ceased to have the social skills and social interest that these villages require and was not, and is worse today at getting to know and collaborating with people. So after a few years it became impossible. We could have done it a year after leaving the Camphill school because they knew him, they loved him and they would have welcomed him in Botton village probably, because he was used to working in that sort of atmosphere. But the local place, good though it is, is not able to have people… it’s not a village in the sense of having a farm and handicraft and things like that.

[0:41:33]

Thank you. Could you tell me what your children thought of your occupation?

Difficult question. I think most families accept what the breadwinner does, because nobody ever asks them whether they liked it or not, they’re born into the family and so I think like any children they probably respected what their father did. Had far more contact with their mother and their mother was a wonderful mother because but for her attitude to my work, I couldn’t possibly have continued working in the Antarctic because I would have been easily made to feel guilty at missing so much of my children growing up. But coming from Alaska and having her father in Alaska who did go away a lot from home as he was an inspector of mines in Alaska, geologist, mining engineer, she was used to that in her youth, that the breadwinner had to be accommodated in the family because that’s where your bread and butter came from.

In the period ‘65-86 when you weren’t actually in Antarctica, presumably you saw your children in the evenings and weekends because your hours would have been office hours?

Normal office hours, yes.

Thank you. [end of track 14]
Could I start by asking you to give me a brief overview of your use of satellite images from the first time that you used it or them until the most recent? I’ll then ask you some more specific questions about particular satellites that I know that you’ve used and worked with because you’ve published on the results of those. But I just wanted first to have a brief overview of your whole history of interaction with satellite photographs.

Yes, I think we first realised the benefits of satellite images, they’re now called, from the weather satellite images taken, used by the world weather reporting system to interpret clouds mostly, but I realised you could see pack ice in them so were getting an idea of the extent of pack ice and also seeing icebergs, because there were some very big icebergs, I mean a hundred miles long, which you could see in the most crude satellite images because of their size. You could see them in the weather satellite images. So I began to track the biggest icebergs and nobody had ever been able to do this before because the Antarctic Ocean is pretty… nobody goes there except a few ships in summer, and was able to track their movement and arranged for regular prints of the American weather satellite pictures to come to, to be mailed over to me because there was not a great rush as there is with weather reporting, that needs to be reported immediately. So they mailed these things to me and I was tracking icebergs. I tracked at least one iceberg for ten years, and this was new. And then of course when our ships going to Halley Station in the Antarctic, which involves going through a lot of ice, got stuck in the ice and naturally they said well on these images you’re getting, can you see which way we should go, and so I did. For years I helped them. There was a mutual friendly disrespect in that they didn’t realise that my short range view of where they were was useless to them. They wanted to know whether they should go east or west or south and when I said if you go south you will come into open water, they would say well, as far as the eye can see we’ve got just ice and nothing else, so you must be misinterpreting the images. Well, it was not that, it was simply that their view was short range and mine was long range and if they ploughed in the direction I suggested they did come into better conditions. So there was a friendly mutual disrespect in using these for helping the ships, but nevertheless they always wanted to know what I thought and this went on.

And then the high resolution satellites, the Landsat series, started and they were not immediate, you had to wait for them, but they were high resolution and when we first got
those of the Antarctic Peninsula, which was very poorly mapped, I realised that they were in fact maps. You’d got to pin them down to say latitude and longitude, but they were in fact maps more accurate than the sketch maps that we had been using. [coughs] The maps we’d been using were made by dog sledges with compass and sledge wheel, which was the explorer’s method of doing it for many years because we had nothing better. [coughs] And so to have a planned view of an area a hundred miles square from 600 miles up was marvellous because it was in fact a plan view of the actual landscape with no estimations of the distance between mountains, although not tied down by latitude and longitude, but that was done simply by having fixed positions where we had stations or some observations to produce fixed points and recognising those fixed points in the images. And so producing a control framework as you have to do in all mapping from above, to hang those images on. But they were planimetrically accurate in areas where we’d had dead reckoning maps with errors of ten, fifteen miles. These were within a few hundred yards and so the Americans had begun with the same, noticing the same thing and begun publishing some as maps, some of these making a mosaic of satellite images to make a map and hanging it on whatever fixed control points you had. And I followed immediately with producing maps of the Antarctic Peninsula in the areas that we most needed, which were the least mapped areas and where I was needing maps for control of the navigation of our aircraft, because this was before any Satnav or anything like that, so our aircraft were entirely travelling on dead reckoning. And once we got these maps, without contours, but they’d got the land in them, the land and the ice in the right place, we used those for navigating, for years until we… in fact we’ve gone on using them but they’ve steadily improved in resolution and we have more fixed points to hang them on and so satellite mapping has been going on ever since and is done by just about every country in the Antarctic because conventional mapping, that is like the triangulation of the British Isles, Ordnance Survey, is so time-consuming and so expensive and it’s all very well if you have a hundred years, but in the Antarctic we don’t have the budget or the time and so it’s been a godsend to have maps made from whatever ground control you have and the detail all put in from satellite images.

[0:08:45]

*Could you then talk about the… that particular practice in detail, the use of the ERTS-1 images, they were the ones that you produced seven line maps and seven photo maps from*
and the satellite used a multi-spectral scanning radiometer and it was the, as you say, the higher resolution system had come in then.

Landsat.

Could you describe the process of converting whatever you got, through the post presumably? So if you could talk about that as a physical object and then the process of converting that into what you wanted, including difficulties?

[coughs] Well, in those days you ordered and paid for satellite images from US Geological Survey. They were quite cheap and you got a hundred miles square from each image and you had to order the right one and the problem was of course some have cloud and don’t have anything on, but the Americans were good at telling you roughly which ones were good, which ones had cloud and were therefore useless. And so I ordered all the ones of our area that had been reported as having no cloud and we could piece these together and make a mosaic. And the actual mapping was done by the Directorate of Overseas Surveys, which was formerly the Directorate of Colonial Surveys and so it looked after surveying on contract for many colonies and former colonies and since we had no mapping organisation in BAS at the time, not until many years later, we contracted out the mapping to them. Initially being professional survey people and working to an accuracy of centimetres they despised these things because we’re talking about accuracy of a hundred metres with satellite images, but I said well, these are far better than anything that anybody has ever produced of the area where we urgently need maps, and so convinced them to do their best, and they did, and they published these sheets for us which were the best thing until we started constructing conventional maps from aerial photographs and ground control in the areas where we had aerial photographs and ground control. And that’s how we got into it and I became, because of my own experience, quite good at interpreting what we were looking at. To some people ice is white and clouds are white, so you could easily not realise that you were looking at clouds and not seeing mountains underneath the clouds, but that to me having travelled a lot in the Antarctic came very naturally, ability to interpret what I was looking at.

[0:12:45]

And so I had published these things and then a colleague who at the time I was at the University of Michigan was an undergraduate had gone to the US Geological Survey and become a respected PhD geologist and taken an early interest in satellite images for geology
and geomorphology in non-polar regions. He saw that I’d been publishing on tracking icebergs and things like that so he got in touch with me and this was many years after we were together in the same place, but we had been friends and he wrote and helped me from then on to get these images and then realised that there was nobody in the United States who could write a volume of… to interpret Antarctic satellite images. There was nobody in the States with sufficient Antarctic experience and photo interpretation experience and they wanted somebody to write a book about it, and so he invited me to do it and it was a first volume of a multi-volume series covering the whole world, covering every continent, which is almost finished now. Took a very long time. But because there’s such a lot of ice in Antarctica he wonderfully published mine before anybody else’s and the arrangement was that he supplied me with all the satellite images at no cost, all the ones which didn’t have too much cloud in, so I built up a collection which still is for those early days the best collection in Europe, he gave me those for nothing and I had a salary so I didn’t want any money from him and that would have presented enormous difficulty because the Americans can’t employ foreigners. And so to have an arrangement where we were collaborating enthusiastically with no exchange of funds, that was very popular with both governments. So he sent all these and I used them for writing the first volume of a series of satellite image atlases that the US Geological Survey was publishing. And I was left with total freedom; he said you can have about a thousand words on a hundred images that you must choose yourself from the whole of Antarctica, so that I chose interesting ones. Alright, interesting to me, but interesting in terms of showing what satellite images can show, and writing my thousand words with enthusiasm because I was seeing things which I could interpret probably better than other people because I’d done a lot of surface travel in the Antarctic. And it wasn’t all obvious, to me, but much less obvious to other people. So, wrote this volume with enthusiasm at the same time as I was having to do my BAS job and so I tended to go back to the office on Saturdays and devote that to [coughs] interpreting satellite images for the Americans. I didn’t ask anybody in BAS, didn’t ask the Director of BAS because it was my time on a Saturday. [coughs] And so that’s how my collaboration with the Americans flowered and has been going ever since.

[0:17:14]
Apart from using your memories of considerable amounts of Antarctic travel, so apart from using your memories, what other records did you use alongside the satellite photos in producing the atlas, in interpreting the images?

[coughs] I thought it interesting to include the history of where people had travelled. So in the Transantarctic Mountains for instance, I showed where, on the images where Scott and Shackleton and Amundsen had travelled and I quoted from their works and that made it more interesting to me and probably made it more interesting to other people. I knew the literature well because anybody who’d travelled on the ground as much as I have always prepared by reading the explorers’ literature of that area. [coughs] So I included references to the classic books, which I still have in my bookshelf [coughs] which are [coughs], which are probably new to a lot of my readers and the combination of knowing the history and therefore the relevance to man and the ability to interpret landscape and write about it, so the Americans were happy [coughs] to work with me.

[end of track 15]
In interpreting the satellite images in order to produce your Satellite Image Atlas of Glaciers of the World...

[CS coughing] I’m sorry.

…and Antarctica, could you tell me what other records you used alongside the images in order to interpret them and to write your text?

I used all the literature that I could find of the areas covered by the images I selected and I selected images particularly in areas where we had ‘ground truth’ as it came to be known, where people had travelled and published about, because it helped me in my interpretation, but also made my interpretation more interesting for other people.

Did you return to any of your own documents, in other words records that you’d made on fieldwork, photographs that you’d taken from aircraft, that sort of thing?

I wrote an introductory section of this book for the Americans in which I used oblique aerial photographs to illustrate particular features that people would not know about, but were common Antarctic features that I needed to mention in my interpretation. And so I began with [coughs]… I began with using photographs taken from the ground and then used oblique aerial photographs to illustrate features that appeared in the satellite images and so I cross-referenced from the oblique aerial photos to the satellite images in showing things that people unfamiliar with the Antarctic would not understand and they might not understand the terms I was using. And one American glaciologist told me years later that when he took on young people to do PhDs on glaciology who didn’t know any glaciology, he gave them my Satellite Image Atlas to read to interpret aerial and satellite pictures because that’s what they would be using in travelling in the Antarctic - nowadays everybody uses satellite images - and I helped them to interpret the landscape. Nowadays you wouldn’t dream of travelling in the Antarctic without having satellite images of the area you’re going to travel in, because there’s so much terrain information, crevassed areas that you can avoid.
So were you drawing on memories of visiting places actually in the images or on experience of seeing similar features elsewhere?

[coughs] Both. The answer is both.

[0:03:51]

Thank you. Now when you were talking about your early use of Landsat images in the – this would have been in the early seventies I think, soon after the launch of the early one, the first one – you said that the image accuracy was a hundred metres.

Yes.

Could you explain for the recording why the inaccuracy could be up to a hundred metres?

Well the resolution was a hundred metres, that is to say anything smaller than that was fuzzy. Every camera of every kind has a resolution that it can be measured and I remember telling people that I was getting a lot more from these images than they could imagine and I remember them telling me, ah, but they only have a resolution of a hundred metres, how can you see a crevasse which is much smaller than a hundred metres? Well, what I could see was crevassed areas because they changed the grey tone that you get in the image and they occur in areas where you would expect crevasses might occur. Later on one could see big crevasses, individual crevasses, but crevassed areas I could see where people said well how can you, because a crevasse is too small to see, it’s less than a hundred metres. And I remember saying, well I’ve seen roads in satellite images of Iceland; my friend/collaborator in the Geological Survey was a great Iceland scholar and he’d sent me some early images of Iceland. Well I’d travelled in Iceland in 1947. And I could see roads and people said, well that’s impossible, a resolution of a hundred metres, how can you see a road? Well in fact you can see a road because in each pixel, picture element, it’s going to change its colour if there’s a road in it, although you are not having the resolution to see the whole thing, but what you see is a series of pixels in which the greyscale is changed in a linear line that if you go to any map you could see if there’s a road there. And so [coughs], so you could see more than people thought you could see and you still can and it’s getting better and better and one of the early satellite images of the Ross Sea near the American base at McMurdo, I picked up the
track of an icebreaker which would have been fifty yards wide, but there was no doubt what it is and I published that as one of the images.

[0:07:20]

The Nimbus 5 satellite which you were reporting on in your publications in 1985 had a microwave radiometer which could detect microwave emissions and therefore surface temperature. Could you tell me how you used those kinds of images as distinct from just a visual…

I didn’t use them any different from the others, certainly there were other scientists who got a great deal out of those in terms of surface temperature and were able to interpret snow density and a lot from them, but I wasn’t doing that, so I was simply using them as essentially photographs.

In your career of using satellite images, did you ever procure images from countries other than America?

No, I didn’t. The Russians with whom I’d collaborated were very, very secretive about satellite images and [coughs] although they had them and had some good ones, they didn’t want to share them and of course [coughs] they always had been paranoid about foreign spies knowing what they had on the ground and the Americans were undoubtedly seeing a lot on the ground in the Soviet Union and the Russians were not happy about it. But the Americans being far more open and allowing Russians to buy their satellite images, I did post-1965 when I came back from the Russians, I teased my Russian colleagues by sending them a photograph of Leningrad in which you could clearly see the road pattern. And foreigners were not allowed to have street maps of Soviet cities at the time. The Russians were always paranoid about spies finding out too much. I suppose they were afraid that when the Americans bombed them, which thank goodness they never did, they would be able to put their bomb in the right place. And there’s a long history of Russian paranoia about geographical information like maps and even to the extent of publishing maps with false co-ordinates which confused Russians as much as it did foreigners. But the Landsat were not accurate in terms of their geographical position but they were not as inaccurate as some of the Soviet maps. And for example, we learned that hydrographic charts on the Northern Sea
Route along the north coast of Russia had false co-ordinates in the hope that American submarines using inertial navigation would follow them and run aground because they’d gone from an area where topographic features were well mapped such as Spitsbergen into Russian areas where they were not welcome and would run aground. And this confused Russians for many years because they had to know whether they were looking at a classified map with false co-ordinates or the real thing. And so there were many maps produced in the Soviet Union which had false co-ordinates. But interestingly, an extraordinary by-product of that is that my Russian colleague, Kotlyakov, was involved in interpreting the Soviet glaciers on behalf of the US Geological Survey. Everybody fell for this wonderful opportunity of getting hundreds of thousands of dollars worth of satellite images for nothing in exchange for writing and so he was a very diligent man and has written an excellent book about the, as part of the series about the glaciers of the Soviet Union, I think that’s now expanded to be Glaciers of Asia, and he, to this day, was not allowed to give precise co-ordinates of the glaciers he was writing about and that you could see in the images. And everybody, his American collaborator, my collaborator, wanted to publish these things with co-ordinates of latitude and longitude where these things were. So in publishing his work the Americans, with his connivance, have quietly put the two co-ordinates on where he was not allowed to write them.

[0:13:34]

You write in 1985 that Landsat could cover seventy-nine per cent of Antarctica. It has covered, you said, fifty-five per cent cloudlessly, but that it could cover seventy-nine per cent. Why was that limit of seventy-nine per cent?

Orbital limit. It goes to eighty-two degrees south, so you’ve got eighty-two to ninety degrees south that the orbit is just not covering.

To what extent then has Antarctic science relied on a technology that wasn’t designed for studying it? To what extent did you rely on satellites positioned for studying other areas?

Oh I think everybody has relied on satellite images in areas which are poorly mapped in every continent.
At one point you suggest that there ought to be a satellite launched that would actually be designed to study Antarctica because of its position in orbit, in other words a polar satellite. Did that happen?

Interestingly enough, it happened there was an American satellite which was classified secret which was recording images of high latitudes in the Antarctic beyond the orbit of Landsat. In other words, areas that I was very interested in. And my colleagues were not allowed to tell me about it, but a sort of a nod and a wink and they said well, we’ve got these, we’ve seen them, they’re wonderful, but I can’t show them to you. Well years later when that was declassified they sent me those images and they are of areas south of where Landsat can go. And I’m sure the Russians had the same thing but they haven’t… the Russians have declassified a lot but I’m not up to date with what’s gone on in the last fifteen years.

When was that American satellite’s images declassified?

I… would probably have to look that up. I can’t remember. It would have been during the eighties.

I see. And the resolution of what I suppose are military grade satellites, was that different from Landsat?

It was slightly less, but taken at different times and therefore very useful for mapping it and has been used for the coastal mapping that we’ve done.

[0:16:36]

Thank you. Could you tell me about any particular difficulties of a satellite scanning Antarctica from space as a landscape compared to say, a temperate landscape or a desert landscape. What are the particular problems of picturing ice from above?

Well, the only one is that in lower latitudes where there are settlements, pretty well anyone can interpret a satellite image because you can see towns and roads and things that we know about and farmers’ fields. So they are just like an aerial photograph that anybody can see what’s there because they get one of the particular area they live in. In the Antarctic there
are so many people who know nothing about the Antarctic but certainly can’t interpret an image which is largely different shades of grey and all different shades of white. It’s only if you’ve travelled on the surface, and you can learn by looking at the areas in which you’ve travelled and you say, ah yes, I remember that feature which is not mapped anywhere, but I well remember it, that people who’ve travelled on the surface are far more able to interpret what they’re looking at.

*I wondered whether the fact that there’s a lot of white, that I imagine the surface is fairly reflective in terms of the way satellites picture, whether that presented any particular problems for the satellite in actually getting the image in the first place?*

Yes, it’s very easy for the print to be washed out and hiding surface features which involve the small changes in the albedo, the amount of reflection, and therefore the greyscale, essentially what you’re looking at. And so in terms of producing a photo print from what is an electronic scan, it can be wrongly exposed to conceal some features, I mean inadvertently wrongly exposed and therefore the feature that you could see, you knew could be much better on a better exposed image, but you didn’t have a better exposed one so you use what you have.

*Were there particular techniques of photographic reproduction that were necessary then? Certain kinds of paper, certain…*

Well at that time people were not digitally enhancing images themselves. Later the keen people who were using satellite images a lot would actually buy the vast amounts of data, I mean hundred megabytes for one image, from the US Geological Survey, and do their own digital enhancement and improved interpretation. And you can still do that, you can buy them all on magnetic tape, as it was then, but it’s all solid state now and a lot of people do, especially the well-resourced organisations do that. I worked entirely with photographic prints from this digital data.

[0:21:11]

*And were the photographic prints made for you outside of BAS and Scott Polar?*
Yes, that was entirely my direct collaboration with US Geological Survey.

So they made the prints for you of the original...

They made the prints for me.

Did you have to give them direction then on how you wanted things exposed and...

Well, Landsat system has, at the time, at least four bands that it’s sampling and these different bands show different things and we quickly learned which one showed the glaciological features that we were interested in and they could see that before they chose them to send to me and I was sent the best band, that is frequency range of the sensor, like any camera it’s got a frequency range which you can control. And so I got the ones which are best for ice.

[0:22:25]

And how do you feel about the effect of the new satellite imaging technology on Antarctic science and Antarctic exploration? How do you feel about the effect of it overall on that?

It’s been a great boon because you can nowadays ask for a high resolution image of a particular area you’re particularly interested in and so you can get images down to ten metre resolution. But there have been commercial satellites producing these and you have to pay for them and that’s meant that only people interested in a particular small area can afford to buy these high resolution images. So the satellites exist but the higher resolution of a smaller area an image covers and you have to pay for it.

I wonder whether you feel that satellite images have had any negative effects on Antarctic science and exploration?

I don’t think any negative effects that I can think of, no. I mean we have such a paucity of information in the Antarctic that anything that can contribute anything is valuable.

[0:24:06]
Does it change the amount of fieldwork that is done in Antarctica though?

[blows nose] Makes the fieldwork more productive, in that the fieldwork where people are is just where people are and you can extrapolate by comparing the black and white or coloured signature of where you are with areas that you are never going to step on and thus you are using the satellite to extrapolate from the areas you have trodden on.

[0:2]

Thank you. Now in one of your papers, which was published in 1985, you write about the failure of glaciologists to communicate the relevance of their science to the man on the street and that led to, you thought, to lack of funding for setting up particular satellite experiments that would allow you to measure the response of the ice sheets to climate change. Could you expand on the perceived failure of glaciologists to communicate?

Well there were a few people in NASA Goddard Space Flight Center who realised the value of their information in interpreting glaciological features such as where there was snow accumulation, where there was snow ablation and even getting estimates of how much snow accumulation. And so they used and they published so at that stage the field glaciologists were being led in interpretations of large areas by people who’d never travelled in those areas but knew how to interpret the satellite data and this is still going on, that there are Americans who have done little or no travel who are far ahead in interpreting things that people who’ve worked on the ground either can’t see or are attuned to small areas, whereas the satellite covers large areas.

At the time there were many people calling for the use of satellites in order to monitor terrestrial earth resources, in other words sort of sites for expansion of agriculture, mineral places, that sort of thing. I wonder whether you could talk about the relative success of glaciologists in securing the use of satellites for their interest?

I don’t think until the… until this century after 2000 that there were satellites launched specifically for glaciology. There’s been one called ICESat which failed for some reason, and there are others planned. But of course there are so many sciences that want satellite
information these days that to have one concentrating on ice would have a lot of competitors saying this is costing us a hundred million dollars, we would prefer to spend on areas of the world where we live and not where you’re interested in. So there’s competition in that, but there’s more and more realisation now of the relevance of ice sheets and the health of ice sheets to climate, to the rest of us, that it’s becoming easier to – and this is all Americans, not the British – producing satellites which are telling us a great deal about the ice sheets.

[0:29:16]

When you were writing in 1985 that you felt that glaciologists had failed to some extent to communicate the relevance of their science, in other words to sort of attract funding and that sort of thing, why do you think that was?

Too few of us, I would think was a very large reason. And perhaps not enough generalists. Specialists were interested in their own little problem, which is quite normal, rather than the wider aspects.

In the period in which you were working for BAS, was the organisation attempting to sort of publicise its science or increase its funding or communicate to the wider public its aims and content at the time?

Yes. [coughs] And I had the opportunity in publishing a review paper of our work in the Philosophical Transactions of the Royal Society and that was a summary of what my glaciology department had been doing, and this I think got out to a wider audience, it was probably a good thing. It was published in a volume of Antarctic studies so had everything there from biological, botanical, atmospheric, in fact three main strands of BAS: earth sciences, life sciences and atmospheric sciences. They were all represented with good papers, so it was a very useful opportunity of showing that BAS was doing a wide variety of things and was in the forefront of many of them.

Yes. I was imagining today at BAS there would be… there’s probably a department of people who are concerned with the public image of BAS and of promoting that. I wondered whether you could tell me about the equivalent in your time at BAS?
There wasn’t much, is the answer. Sir Vivian Fuchs despised the press as being irrelevant and perhaps popularising, which I think we now accept was quite wrong. And so there is now a department in BAS that’s very good at publicising the discoveries of BAS and they issue press releases when there’s anything worth talking about. Well in my time there were no press releases, almost no press releases at all. If people from the outside asked questions we would answer them. We wouldn’t go out of our way to tell the general public what we were using and it was only when funding became tighter that I think scientists in general realised that they were in some areas divorced from what the public was thinking and this affected funding.

[0:33:17]

_Did the, did a public view of BAS as being concerned with exploration affect the ability to communicate its scientific aims to any extent?_

Yes, but I think we had to avoid talking about things like exploration because it had so much baggage of Scott and Shackleton attached to the word, so I suspect we did use it but we had to be very careful because so many people thought that exploration was finished, now we should get on to science. And so that’s what happened and in publishing our science we had to struggle to point out its relevance to the rest of the world.

[0:34:25]

_Now I’m going to ask you in a little while about the GAP project in particular, but first could we just talk more generally about the Antarctic Peninsula and you joined BAS in ’65, when you joined your field in the Antarctica became to some extent the Antarctic Peninsula because BAS had bases on the Antarctic Peninsula in the Weddell Sea area: Fossil Bluff, Halley, Faraday, Rothera, that’s where they were. How did you feel about having this area as your main field of interest, this particular area?_

Well I had to take advantage of where we could get to. I mean I’d been spoiled if you like in having been with the Americans with a wider focus and having had their ability to take me from A to B over a wider area than BAS could. So I was confined to the range of the aircraft, but anything within the range of the aircraft I could do and we did, but it was surface work at the time and it was quite clear that a lot of new things were being learned by doing
ice drilling for palaeoclimatic studies in different areas. The science developed certainly because of a Greenland ice core that went right to the bed of the ice sheet in Greenland, followed by an Antarctic ice core, went right to the bed. And those were tremendously valuable, but people started saying well, they may be relevant to the particular places where they were drilled, they may not be the same everywhere. So since then there have been innumerable cores drilled in different places to see what the differences are, see whether the climate record as recorded in the first ones is uniform over the continent. And that is still going on and we couldn’t start it in the Peninsula until we had some idea of the ice thickness in different places isolated from contamination. But that drilling didn’t begin till after I’d retired. I mean not much beyond ten metres depth, but I’d certainly been foreseeing it and understanding ice thickness all over was the obvious precursor to choosing sites to drill.

[0:37:38]

What were the particular advantages of the Peninsula as a site for Antarctic as a site for Antarctic fieldwork?

No particular advantage except that they were representative of that latitude, the climate of that latitude, because the high latitude drill holes are more popular because there wasn’t melting to complicate the picture of your ice core. On the other hand, in wanting to discover whether climate change extended into South America, for example, [coughs] our knowledge of latitudinal variations in the Antarctic Peninsula was valuable when people started to do palaeoclimatic studies in South America and we found this had continuity in terms of changes with latitude in South America and now this drilling has been done all over and there are [coughs] the specialists who’ve done ice cores [coughs] all through South America and other continents [coughs], but they have to go higher in order to not get the… in order to get an area where there’s snow accumulation without it all being melted off in the subsequent summer. So that this particular colleague who has been drilling at places up to 6,000 metres in the Andes because there it’s cold by polar standards and there’s very little melting and he takes a core which may be a hundred metres or more depth and interprets that. And so there’s a latitudinal range of information about climate change.

[0:40:18]
I see. And in the seventies when you were writing you mention that the Peninsula is relatively under-studied glaciologically, why was that?

Because it’s such a miserable place to travel in and work in. The weather is more maritime and therefore worse; more fog, more snow in some areas which makes travelling difficult. So compared with say the Ross Sea side where I’d travelled before, it was difficult and there are a lot of… it’s all mountainous and access to the interior [coughs] is [coughs], is difficult because of steep glaciers coming down to the sea and badly crevassed glaciers, and so actually getting initially a dog sledge up there, or mechanical transport later, is very difficult. So to get to the plateau the best way was to fly in and still is, but in other areas of the Antarctic you can put down your dog sledge or tractors or whatever on the shore and expect to travel long distances. It’s much more difficult in the Antarctic Peninsula.

[0:41:57]

To what extent then was your interest in international co-operation, I mean with Americans rather than with the GAP project, part of a wish to sort of extend the range of work beyond the Peninsula or to experience other environments?

[coughs] Very much. I was aware that we were scratching the surface and only by collaborating with other countries could we cover a greater range of science than we were able to cover ourselves and that’s why I convened this Glaciology of the Antarctic Peninsula Conference in order to invite people from other Antarctic nations to come and help us fill in that gap in knowledge and did. It took time to take effect after publishing this, but did attract Americans and others to come and work in the area and so in the long run, slow to start, but it’s been very successful in promoting collaboration between BAS science and other country’s science for the particular thing for which the Peninsula, because of its wide latitudinal range, presents opportunities that you don’t find anywhere else in the Antarctic.

Such as?

Just that you can have a series of drill cores covering a wide range of latitude.
I wondered whether as well as attracting co-operation to work on the Peninsula, you were interested, having been as you said, spoiled earlier by really experiencing quite a lot of different areas around Antarctica, of it being a way of, you know, not being just fixed on the Peninsula but being able to continue to work across Antarctica?

Absolutely. That was so instinctive to me in wanting to collaborate with people all over the continent for particular projects and to overcome this resistance that some countries had because stations in the Antarctic are few and far between so collaboration is not easy, but the more people working in the Antarctic, the more nationalities, the more it’s realised that our studies are far too local where we could get to, and were not the range of understanding coming from taking the same measurements in lots of different areas was not being exploited and the International Geophysical Year in 1957/58 was the first leap forward in that, that it was agreed in glaciology for example that identical studies should be done by a number of different nations in order to get a network covering the continent.

[0:45:43]

Thank you. Last time you spoke of a slightly conservative culture at BAS and you’ve said today that there was a tendency for BAS scientists to view their science as better than other science, you’ve talked about the culture inherited from Fuchs of suspicion of working with other nations. To what extent did the historical fact of BAS bases being in that particular place of Antarctica contribute to that? In other words, is there a link between, or what is the nature of the link between the physical isolation of the British bases and this conservative culture do you think?

We had the advantage of having people who were prepared to take year round observations. Other countries find it quite difficult to find scientists who will winter over. But the association of BAS having derived from adventurous people who think nothing of spending two years in the Antarctic without coming home gave us an advantage over other countries where they wanted to work for one month, two month or three months and to us in collaborating, they were spoiled and we were prepared to do what was necessary. On the other hand the scientists who didn’t want to spend more than a month in the Antarctic were some of the best scientists in the world, so if we despised them we would never get anywhere. So it was important to collaborate with any good science anywhere and as the
BAS fleet of aircraft, in other words the BAS logistics improved, and I mean they now have four Twin Otters and a four-engine plane, steadily improved, we could get to places where people wanted to go and we could get them there quickly and so even people who had been spoiled on the other side of the continent could take an interest in the particular advantages of what we had uniquely, a wide range of latitudes in low latitudes.

*What do you mean by spoiled on the other side of the continent?*

That working out of McMurdo you say I want to go to this and that place within 500 miles and they’ll take you there. Well we just had not the ability to do that and I was pushing all the time to increase our range of latitudes and places we could go to. And because I felt confined, because of my previous experience, and BAS aircraft had conventionally only worked in the Peninsula and not very far south in the Peninsula. And so I was pushing the range all the time and at one stage gently, not quite as bad as reprimanded, but something like that by Dick Laws because I was pushing to areas that BAS had never worked in before and he thought well, is this dangerous extending our range like this. But I kept on pushing at that frontier and then one day approved of one of our aircraft going round the Weddell Sea to Halley Bay and I think the Director only found out about that afterwards. And he understood the scientific merit, but some of the logistic people in BAS were concerned about whether it was safe to go so far from where we had traditionally worked in the Peninsula.

[0:50:29]

*Safe here, does that mean literally in terms of health and safety, the safety of people’s lives, or something else?*

It does mean that in that you could be caught out by weather, but my attitude being caught out by weather is simply land and camp and wait for better weather. And I got that eventually accepted by BAS air crews and the management, but air crews as I discovered working with the Americans have a great attraction to a sprung bed at night and don’t like being caught out in the open and regarded camping out as a survival exercise rather than just sensible precautions when you run into bad weather. And all pilots have considered camping in tents as being something a survival situation and I was fighting this for years in BAS and got it about the time of Giles Kershaw, understood that the first thing a new pilot had to do
was be taken out to camp in a tent to show that we have very comfortable tents, very
comfortable sleeping bags and plenty of food in the aircraft always, which are called survival
rations, but in fact were the same rations that the surface travellers were using. In other
words, you would last an awful long time if you landed. And that camping out was not a
survival situation to my generation who’d lived six months in tents, it was just the way to do it.
And so after I left – no, I hadn’t yet, 1983 when we had this first good collaboration with
the Americans in an area between the Ellsworth Mountains and Thiel Mountains in an area
which hadn’t been geologised, I flew with them at the beginning of the season to sort of rub
this in and with a pilot called Garry Studd and we didn’t have weather information over
hundreds of miles and therefore you had to go and see what it was and I knew by then that…
well, I’d learned all my life that white-out is the greatest danger of flying in the Antarctic and
the [Air New Zealand] DC-10 had gone into Mount Erebus by then. And therefore that
camping out should not present any problem at all and with Garry Studd we were just
chugging along on the way to these geologists and ran into white-out which was obviously
going to develop into poor visibility and I said well let’s turn back and land. And so we
turned back and landed and pitched the tent beside the aircraft. We had the emergency radio
in the aircraft so we took that out and were sitting comfortably in our sleeping bags
transmitting to our base at Rothera, saying all is well but we’re just waiting for the weather.
And so they weren’t worried and we weren’t worried and having seen the Americans get into
really dangerous situations through wanting to get back to a sprung bed, I was very anxious
to emphasise to BAS people that sleeping in a tent was not a survival situation, it was
common sense.

[0:55:00]

*Can you remember in any detail the conversation with Dick Laws in which he’s sort of telling
you off for attempting to extend the range of British work?*

I think he would say that he was not telling me off, that he was just surprised that we had
been that far without asking permission, whereas I left the safety of aviation to the pilots to
decide where you could safely go and of course they’re responsible for the aircraft and all
lives in it, so they wouldn’t go anywhere where they were not happy. But since BAS had had
many years not flying outside the Peninsula it was not surprising that the Director would
think well, why have you gone further, but I was looking at global science and Antarctica as
being stomping ground, and so it was quite natural that I would want to go further if the science was helped by it. And that particular occasion was when we had put an airborne magnetometer in the aircraft which allows you to learn something about the rocks underneath the ice, magnetic susceptibility with the rocks, and so anywhere we could fly was providing new information on sub-glacial structure in the same way, and totally different information, but in the same way as radio echo sounding provided you with an ice thickness. So I think if you tackled Dick Laws he would say I was not reprimanding Charles for doing this, I just would have liked to have been informed.

Was there anything other than safety considerations that put up resistance to the extension of the range of activities? Was it just about safety or was there anything else going on?

It was about safety and the fact that fuel was difficult to get down enough fuel in the BAS ships and at one stage I was limited to a thousand drums of fuel a year. Well, drum fuel in Punta Arenas, Chile was remarkably cheap and to run any aircraft is not cheap. And so my position was that we should give the aircraft whatever fuel it needed to do the work it was doing and that the actual fuel cost was a small proportion of the business of operating aircraft. And so I was given a thousand drums and that meant that towards the end of a summer season we had to ground aircraft that were in perfect condition, serviceable condition, and having scientists sitting waiting to use them and saying, well we have the fuel but we’ve got to keep it for next year.

[0:58:47]

I wondered whether tradition and conservatism and habits played a part in not wanting to change what was done and where was...

Undoubtedly. Because in the support people, which are very valuable and you can’t do without, and most of them had, they’d all worked in the Antarctic, almost all, and some of them had travelled, they were accustomed to things being done as they had been done and were a bit conservative about going further and they could easily say to the management, well these scientists don’t realise the safety implications of what they’re doing and I think most of the scientists are not stupid and could see that. And so the BAS habit became to send a field assistant with every scientist in the field, geologist or glaciologist, and the field
assistant’s qualifications was that he’d been an amateur alpinist and had learned rope
techniques and therefore could expect to rescue people from crevasses, whereas previous
generations was sink or swim. We taught ourselves how to behave with crevasses. And
BAS has continued with this ever since and it’s a jolly good system because you have highly
qualified good scientists now selected because of their scientific merit and having had no
experience of travelling in mountain country, and so having a field assistant who is
responsible for your safety is a good thing. But change takes time to bring in and so there
was a certain amount of resistance to that. They could say well you’ve made us, our
department, responsible for safety and these scientists want to do wild things and we are
trying to stop them getting into trouble. And so I felt somewhat inhibited by that. I could see
how it happened but I felt somewhat inhibited because I had more experience of travelling in
the Antarctic than any of the people who were saying wait a minute, you don’t know enough
about it, and I had much wider experience of travelling in the Antarctic and therefore
certainly wouldn’t send people into danger if I could avoid it.

[end of track 16]
Could I ask you to tell me about the beginnings of the GAP project? I know that it started in a 1972 meeting of the Glaciology Working Group of SCAR, which is itself part of ICSU – International Council of Scientific Unions. Now, I wonder whether you could tell me about that meeting of that working group that decided on this?

Well I think I was chairman of the Glaciology Working Group of SCAR at the time and so it was not difficult for me to convene a meeting with the world’s glaciologists because I knew most of them. But my object was simply to get more people interested in the Antarctic Peninsula, which as I’ve told you is a miserable place to work because of the weather and difficulty of travelling. And it was a very successful meeting in that my report was compiled by me from submissions of different people who took part into how their interests could be catered for in the Antarctic Peninsula area and we all had in common that we needed our governments to fund things, to find scientists willing to go and to be able to get around. And so an agreed programme was the obvious way to go because individually each department in BAS and the Scott Polar was on the face of it competing with others for funding and the more support you could get internationally, the more support you had in your own organisation. And we produced this report and everybody was very pleased, but nothing much happened at the time because people can’t immediately switch off from whatever research they were doing at the time, so it served mainly as planting seed, which took time to grow, but did grow and it was really not until about the time I left that things started to happen in the Peninsula, all dating back, dating back to the GAP project, but once they got going themselves they forgot about the origin, the GAP project, and that’s fine, what I wanted was self-powered scientists who wanted to do this in their own right. I think for years they all quoted the published GAP project as something on which to base their interest, but once they became experts in their own right in the Antarctic Peninsula, they just got on with whatever collaboration they could do within their own field.

Now we know from the report that certain kinds of glaciological work were decided upon as priorities: ice coring, snow chemistry, radio echo sounding, mapping, levelling between nunataks for accumulation, various kinds of climatology and sea ice studies, but I wonder
whether you could say more about disagreement about what ought to be studied in the area, disagreements at the original Working Group meeting and the follow-up three-day meeting in Cambridge?

I may be blind or deaf but I can’t remember the disagreements. Every scientist is interested in what he is good at and has slightly different and so I don’t remember negative contributions, people saying that was a waste of time, but then again perhaps I would not remember some negative input to anything that the rest of us wanted to get on with. So what was actually done was entirely on the initiative of the individual scientists who wanted to take part.

[0:05:16]

Now this may include GAP, but could, taken the broader context, given the kind of geographical proximity both of bases and of continents, I wonder whether you can tell me about relations between BAS in Antarctica and the South Americans at this time? I know that in your book you talk about visits and exchanges, but the wider context of relations with South America?

Well the only countries active in the Peninsula were Argentina and Chile and the Americans having one station, Palmer Station, which didn’t have any… Palmer Station didn’t have any field programmes at all. At that time the Argentines and Chileans were frightened of travelling and in fact frightened of living in tents because they didn’t know, they had no experience of it and I’ll tell you an interesting anecdote later, the year I retired I camped in the Ellsworth Mountains with some Chileans and they were so terrified of the idea of freezing to death at night, though they had tents and sleeping bags, they kept an electric heater going all night to keep warm, which meant they had a little generator a hundred yards or less from their tent put-putting away all night, give them heat in the tent, which gave us a great deal of laughs because anybody who had a background of BAS had spent months in tents with no heating at all. That’s why I think the Argentines and Chileans have always been in my time very willing to collaborate because they knew that we had confidence to travel and to do whatever projects we had without worrying about the environment, you’ve got to prepare for it but not worrying. And so I got on very well with the Chileans, but before that with the Argentines I knew the two leading Argentine glaciologists: Dalinger and
Colqui and they were both very keen to collaborate and had to overcome resistance in their
country because of the territorial dispute between Argentina and Britain, but scientists
shouldn’t worry about things like that and I know those two didn’t, they wanted to get on
with the job. And so we agreed on collaboration and during the 1975 radio echo sounding
flying season I was navigator in the right-hand seat of the Twin Otter. I had been asked by
Dalinger or Colqui to train a glaciologist because they didn’t really have any, and so I
welcomed that move and invited him to Cambridge and he spent six months in Cambridge.
In the course of that this flying season came up, we were doing radio echo sounding and he
was a passenger, learning the trade, but very convenient that he spoke Spanish and therefore
for all communications with the Argentines, with whom there was always a certain tension
for political, Falkland Island reasons, he could smooth things out saying he was there as an
official Argentine delegate and officially collaborating with the British. And he smoothed
the way for us on landing our aircraft and even getting some fuel at one of their military
stations, which was against their instincts and it was simply because they had been instructed
that they were to collaborate. They had the ability to extend the range of our aircraft by
giving us fuel and since all the South American stations, all the Argentine/Chilean stations
are military and not scientific, they’ve had some scientists working with them but in fact the
management is all military and they’re of course immersed in the politics and the three
different claims to the Antarctic Peninsula. And so the military had to be commanded from
above to collaborate with us. I didn’t ask anybody because I knew that collaborating with
them was not in any way detrimental to the British claim to the area. This was after the GAP
meeting and it was a follow-on from that. It made it easier because everybody had read about
what we were trying to do [0:11:26]. I remember addressing a military meeting in Buenos
Aires, the Argentine Antarctic Institute was then and still is a military organisation, which
seems very odd to us, but it was, and I had these satellite images which nobody else had at
the time – not that they were impossible to get, they just didn’t have any scientists who had
sought them – and I addressed this gathering with Argentine military officers who had been
told to take an interest in the Antarctic, and showed them what the satellite pictures were
revealing. And they could have got them themselves but they didn’t have anybody who was
seeking to get them, but straight after that they did get them. I wanted to just spread the word
as much as possible and so this was a useful contact that I had, they could see that if they
were suspicious of military applications that at least they shouldn’t be because we all had
access to the same information.
Can you remember who you were speaking to in that meeting? You said there were some military people, can you remember the make-up of the audience?

If I didn’t mention it in *Forty Years on Ice* it was because I didn’t note any names. Well, they didn’t stick in my memory. I must have had a list of some of the people who were there and they were rather po-faced I think, because a gathering of military men in Buenos Aires faced with an Englishman who they would have seen as representative of this foreign power trying to claim their territory, whereas to me not involved in politics, it was nothing to do with it. But they looked, they looked slightly suspicious in the way that a meeting with the Russians because of the Cold War would have looked, slightly perhaps stunted in those days. I could see all this but I ignored it.

How did you come to be giving the talk, did it happen?

It was through showing my satellite images of the Peninsula to René Dalinger who had worked with Argentine military in the Antarctic, he had wintered in the Antarctic and was interested in glaciology. He was the Argentine member of the Glaciology Working Group of SCAR. And so I knew him and I knew that he was a serious glaciologist and when I showed him the satellite images of areas in the Antarctic Peninsula, he said, ‘Well our people must find out about these, they’re not using them and you say they’re not secret?’ and I said, ‘No, they’re not secret, anybody can get them’. And so I think he arranged it.

I see. And at this time did you have any relations with the small community of people in the Falklands Islands, any meetings or…

No, but the BAS ships had an advance base in the Falkland Islands so the BAS ships on the way to the Antarctic always called in at the Falklands, Stanley, and it was an essential part of the itinerary and also a radio station in Port Stanley looked after communications with BAS stations in the Antarctic.
Do you remember a particular time when you went to Port Stanley on the way to Antarctica?

Every time I went on a field season with BAS people.

And who did you tend to see there?

The man in charge was Ted Clapp who’s still going strong, long since retired as we all are, and he was responsible for supplying anything at shorter notice than ordering it from the UK. Ordering it from the UK you would have to wait until there was a ship coming out. So he ran a support base with whatever people had forgotten or supplies that ran out, building materials for example, fuel, he arranged for all that so that the next BAS ship coming into Port Stanley could load up. And this was a very successful arrangement. He had a small staff and he had a small hangar where he could assemble things. He could buy food locally and this was a great advantage.

[0:17:25]

Thank you. Now, could you please in as much detail as you can remember, starting, if this is where it starts, with the phone call and ending with walking out of Number 10, tell me about the story of being called to Number 10 at the outbreak of the Falklands War.

Yes. Well I was working late at the office, everybody else had gone home. I mean I tended to work late at the office to do things like the Satellite Image Atlas and call came asking for the Director, Dick Laws. But Dick Laws was at a biological conference in Tasmania at the time and so I probably would have said, ‘Well is there anything I can do for you?’, and the voice from Number 10 said, ‘Yes, would you come and talk to us about the Antarctic’. I think they probably used the word Antarctic because we were not expert in the Falkland Islands, and of course I said, ‘Yes’ and they said, ‘When would be convenient?’ and I said, ‘Any time’. I mean there was a war on, I would have gone at three o’clock in the morning if they’d asked me to. And they had been given three names, I didn’t find out till long after the war, by Lord Shackleton: Laws, Adie and Swithinbank. And Adie was available and I was available and so I said, ‘Well the two of us are happy to come’ and so I was the contact and when they called later, ‘Well’ I said, ‘I can come tomorrow’ and they said, ‘Well that won’t be necessary’, it was two or three days later I think. So I was liaison with Number 10 and we
agreed on a time. And we didn’t think twice about it, I mean if the Prime Minister asked to see anybody, it’s natural to want to comply. And so we were shy about going to Number 10 and at that time they had just built a gate – no, not even a gate – but just a tape between stanchions across so there was a limit to where the public was allowed to go. And we wanted to be as inconspicuous as possible, we didn’t want to get into the newspapers because with the war on there were far more important things to worry about. So we got a taxi from Kings Cross and went to the opposite side of Whitehall and crossed by ourselves as pedestrians and went to the policeman at the gate and said, ‘We have a meeting with the Prime Minister’. He said, ‘What are your names?’ and I said, ‘Adie and Swithinbank’ and he’d obviously been briefed because he opened the barrier and let us through. And then as we approached Number 10, the door of Number 10 – no, there was a policeman outside who asked exactly the same question, ‘What are you doing?’ and I said, ‘Adie and Swithinbank, we’ve been invited to talk to the Prime Minister’. At that point the door of Number 10 opened and was ushered inside and ushered up the stairs, unaccompanied, just the two of us, but there was a small sort of drawing room facing the top of the stairs and in it was the Prime Minister - and I remember thinking how beautifully coiffed she was without a hair in the wrong place - holding out her hand to welcome us and being very friendly, and led us into a room beyond the Cabinet Room overlooking the Horse Guards Parade. And she sat on one end of a sofa, I sat on the other, Ray Adie opposite on a chair the other side of a coffee table. And she said, ‘Would you like a drink?’ and we both said, ‘Yes’ and she said, ‘What?’ and I think we said, ‘Gin and tonic’. She was happy about that. And when the gin and tonic was brought for Adie and me, she was brought, without being asked, a glass of whisky – that was her tipple. And she began by saying that she had invited us there, as people who know about the Antarctic, was because she as Prime Minister was terrified that the war, which had only been going weeks at that time, might spill over into the Antarctic and that would be far more serious because it would be a breach of the Antarctic Treaty, it would concern every one of the twelve nations that had signed the Treaty and present a physical danger to our station. So that the first thing she asked was if one of our stations was attacked how long could we hold out? And since our stations are purely scientific, the answer was thirty seconds or something, we have no guns and we’re scientists and we could not hold out at all. And she said, ‘Right, I understand’ and went on to the next question. And this questioning, very interesting, very relevant, went on for the whole of ninety minutes, just like a good radio or television interviewer without a pause, even when our answers were ‘yes’ or ‘no’, she had another question ready, it seemed without strain, but it showed that she had all these things
pent up inside her and didn’t trust the civil servants who said, ‘Well, I’ll find out the answer to your question’ and of course she was impatient and understandably so. And luckily we could answer everything she threw at us, either one or other of us would speak and another critical thing she asked, because the war began you know in South Georgia the day before it went to the Falklands, she said, ‘Could we build an airfield in South Georgia?’ and we knew where you could, at enormous expense, build an airfield, and mentioned, I said that it would involve removing perhaps a couple of hundred thousand breeding pairs of king penguins, but would be physically possible at enormous expense of many millions of pounds. [0:26:24] And so on to other questions, I’d answered that one, so on to other questions. And the background, I mean I can’t remember all the questions because they were just coming at us hard, I do remember that we were able to answer them. She was very well aware of her own ignorance about the Antarctic, understandable, and determined to do something about it.

And after about an hour when she saw that our glasses were empty, she said, ‘Could I fill you up?’ and there had been a Private Secretary about thirty feet away sitting on a chair and obviously writing notes and she never had to say, ‘Write that down’, but she nodded at him if we’d made an interesting remark. Very gentle nod as you would bidding at an auction, he was expecting it and what the nod meant was, write that down, which he did. So he was there and she said, ‘Would you get us a refill?’ and as he got out to walk out, she said, ‘Bring the bottle!’ and we thought that was a very good sign and it meant that we were not about to be discharged [laughs] and that we were answering questions she wanted. So he brought the bottle and refilled our drinks and her drinks and left the bottles on the table. And eventually of course she ran out of questions, but being very polite we were wondering whether we should shift towards the front of the sofa or something, but it was obvious that it was up to her to end the meeting and we were wondering how she would end it. And she ended it by saying, ‘On the way out I will show you that I have arranged in the Cabinet Room a number of scientists’ – I forget who they were, Faraday certainly – portraits to be hung on the wall of the Cabinet Room. In other words she was reminding us that she was a scientist herself, a chemist, and we would naturally be interested in the fact that she had an interest in science. And so that was clear, that that was the very polite invitation to leave and she took us through the Cabinet Room and showed us, I can’t remember who they were at the time, and then at the head of the stairs, I think, I somehow feel that it was a different staircase, she said, ‘Well this is where I go up, we have a small flat upstairs, and this is where you go down’. I remember the staircase is lined with portraits of Prime Ministers and quite a narrow staircase. So we shook hands, lots of smiles and thanked us very much and we went down and caught a
taxi and a train back. But what amused us was that a week after our visit she had a visit from Ronald Reagan and he was given half an hour, not one and a half hours. [laughs]

[0:30:40]

Do you remember her appearance in any more detail, what she was wearing?

I don’t remember what she was wearing, but very well dressed and she must have had her hairdresser in I think, I don’t know, but I think she probably did very frequently have her hairdresser in because she liked to look very smart. But I can’t, no, I mean I’ve never been one to remember ladies’ dresses. I was far more interested in her intellect, which impressed us greatly.

In terms of that, could you tell me a little more about the kinds of things she was asking about Antarctica? You said that she was very honest about the fact that she was a beginner to the subject, but I wondered at what sort of level she was asking her questions, given that she had a scientific background?

I can’t remember a lot and considering it was a continuous conversation for an hour and a half she must have asked what BAS was doing and our relations with other countries, probably particularly South American countries, and when there was what we took to be hesitation, we expanded what we were telling her to broaden her understanding, which you really need in that peculiar circumstance. I mean if she had asked, and I can’t remember if she did, ‘And do you call on your next-door neighbours?’ and the answer is your next-door neighbours are 500 miles away and you have no means of getting to them, but we certainly would have talked about the relations with other countries, notably Argentina and Chile, and the fact that we had never had problems with them, except noticed that they were military stations who sometimes hosted a grateful scientist or two grateful scientists from their own country. But as I knew the grateful scientists, I knew the other side of the story and that was that they didn’t get a lot of support, that the priority in being taken from A to B was always depending on military rank and the scientists were a token there, but scientists understandably are going to take whatever help they can get and so we would have discussed this.

[0:34:09]
And curiously enough, by chance my friend in the US Geological Survey, either he or the American Defence Department when the Falklands War began, naturally realised that they, the military wants to know about all war zones, didn’t know anything about the Falklands and didn’t have satellite pictures of the Falklands, and they had arranged to turn Landsat on as it passed over. Landsat only had ten minutes of recorder time in each orbit of the whole world and everybody was competing for part of that ten minutes and the Falkland Islands hadn’t a leg to stand on, it was remote, but obviously the military had said well, we want to know about these little islands where they’re having a war, so they’d switch it on. Well, my friend, Richie Williams, being very much involved, a leader in satellite image studies, particularly Landsat, heard, I suppose through the grapevine, that they had done this, and very rapidly went and ordered two copies of the two images covering the whole of the Falkland Islands – well, I think it was three or four copies – and sent them to me by airmail and they arrived on the day before we went to the Prime Minister, and this was pure chance, I didn’t know they were coming and I was extremely pleased to get them because it meant I had something to show her. And so I rolled them up in a cardboard map tube and took them and after we had finished talking about the Antarctic I showed her these and we will have had some kind of conversation because by that time our army was halfway across the country from where they had landed and we had had a ship sunk and it was a nasty war, but the army or marines were hiking across the country and we could see in the satellite images the area that they were hiking in. Well, she didn’t say – and she wouldn’t have known anyway – whether our Defence Department had got hold of them as rapidly as I had, quite probably not, they might have enquired as to whether there were any satellite images and the answer at the time would have been no, only weather satellite images. And so I think it quite possible that I was the first to get them and very lucky to get them just before being able to spread them out in front of her and of course if she had seen them all she could have said, ‘Oh, I’ve seen those’, but she was really interested. So that bit I remember because when we’d finished talking about the Antarctic we naturally began to talk about the war in the Falkland Islands.

[0:37:59]

Do you remember what she said when you showed her the maps?
Well she… I pointed out what you could see in the images and pointed out where our troops were coming across the country from San Carlos heading for Stanley and since she may have had briefings with the published maps and certainly had not had briefings with something that you could really understand, because it was what you actually see from flying in high, flying satellite. So she was interested and I was able to leave them with her because I had enough copies to leave them with her. And afterwards, after the meeting there were two interesting follow-ups. One is that my friend who was the – John Heap – who was the Foreign Office Antarctic desk at the time, who again I’d known a very long time from the Scott Polar and while I was in Michigan I had invited him to come over because he was interested in working in the Antarctic, so I invited him to come as a field assistant and he did, and he carried on after I left in 1963 for a year or two, and then took on the Foreign Office job. He indicated that when we were invited to Number 10 the proper procedure for a civil servant or the equivalent of a civil servant was to ask higher authority whether we may go, and we purposely did not do that because we had been invited by name and what normally happens in the government is that the Prime Minister asks the Minister the relevant question and the Minister of course who doesn’t know the answer says, well I’ll find out rapidly, and so the question, as with a Parliamentary question, goes rapidly down the ranks to the particular person who knows the answer and then goes up again through the ranks and the Minister feeds it to the Prime Minister as if he knew it all the time. This is standard procedure and has the advantage that everybody of all stages knows what’s going on. But we thought it was a great privilege to go to Number 10 and realised that if we called our bosses they immediately call Number 10 and say these are very junior people, you should send us, but Margaret Thatcher knew what she was talking about because she was a great friend of Lord Shackleton, who sat on the wrong side of the House, he’d been Minister of Defence in the Labour government, but socially they were good friends. And she had asked him who to talk to, who knew about the Antarctic and he had said Laws, Adie, Swithinbank, the three names. So that’s how she came to talk to us and that’s why we didn’t ask permission from anybody else. I was never rapped over the knuckles for it, I was just informed that the correct procedure would have been to go through higher authority, and I certainly would not change my behaviour because of that. She had a reason for going to people and she had a reputation for asking about people who really knew the subject and not waiting for it to go up and get distorted on the way back down again. So she routinely did this and her civil servants routinely didn’t like this because it meant they didn’t know what was going on and that questions in our discussion certainly would influence public policy and of course civil
servants want to know what’s the background to any public policy and it’s no good for the Prime Minister just to say, ‘Do this’. They would want to say well, do you know what you’re talking about, and she would say, ‘Well I have actually talked to people about it’.

*Did she tell you why she’d chosen scientists to put in the Cabinet Room as portraits?*

Well Lord Shackleton had and he… well, there weren’t any other than scientists who’d worked in the Antarctic area, you see. BAS was the only British organisation working…

[0:43:52]

*Oh no, I mean on the way out she said, she told you to have a look at some portraits that she’d had erected in the Cabinet Room of scientists, I wonder why she… I wonder whether she told you why she had decided to put portraits of scientists in the Cabinet Room rather than military leaders or…*

Oh, there was a very clear implication that she was a scientist herself and that’s where her real interests lay. That was not discussed, but there was obvious implication.

*Was evidence of her scientific background apparent in the discussions, in her questions?*

Well not much science came up. So I can’t remember anything relevant, but being an educated person she was not afraid of getting into fields she didn’t know about, as some uneducated people might be because it would show their ignorance. She had a lot of self-confidence, as you know, and therefore by asking questions about something she didn’t know, she didn’t feel demeaned by.

*Was there anything about her that you, in person, that was different from your impression of her through the television or through the radio or through the newspaper?*

No, just supremely confident of herself.

*And did you have any sense that she had a pre-existing view of BAS before meeting with you?*
No. Didn’t.

_Could I…_

We were the only people to ask.

[0:45:38]

_Could I ask you what was the effect of assisting the Prime Minister on future funding for BAS?_

Well, future funding increased from then on and I personally feel sure that what we answered about what we were doing and why and what science we were doing was relevant. Of course the poor Director, Dick Laws, who was out of this although he had been invited, no doubt thought that it was due to policy papers that he had been putting up and continued to put up and you can’t blame him for that, he was the Director and we weren’t.

_So the funding went up? I think it almost doubled in fact didn’t it?_

It did, very quickly, yes.

[0:46:44]

_So now’s a good time then to ask a more general question about funding and that is, to what extent did BAS in the period that you were working for them, and perhaps afterwards because you still have links with them, to what extent when you were working for them, did they feel secure about their position in relation to the funding that was coming from NERC?_

I don’t think BAS has ever felt secure in that people are mostly university professors who are understandably after increasing funding for their universities. So we knew, I think calling them enemies is too strong, they were competitors and we were always competing with them. I mean some of them are very good friends but they were competing with us for funds. And they knew this and we knew this, but having explained to the Prime Minister, I do remember explaining to her that we were by far the cheapest form of occupation of a territory that we
claimed, the alternative being if we’d put in military like the South Americans did. Well that
costs far more than employing some scientists and I do remember that we both got this point
across, that whereas BAS was expensive, it was actually the cheapest possible way of
maintaining a presence.

[0:48:40]

*And can you tell me more about BAS’s sense of its own vulnerable position in relation to how
important government thought it to be in your period?*

Well, the Foreign Office wanted to maintain our territorial claim and still does and still do,
but they couldn’t pay for it because they, their money went on embassies and things
throughout the world. And so they were strongly supportive and always have been of BAS
on the grounds that here was a presence in territory that they claimed, that they, the Foreign
Office, were not paying for. And so they could push hard on our behalf for being there and
being the cheapest way of being there, and this didn’t mean – and I’m sure the situation goes
on today – where other scientists in Natural Environment Research Council did not enjoy the
support of Foreign Office because it was irrelevant to their scientific departments and so we
always had to face people who said well, BAS is not getting money for science, it’s getting
money because it’s occupying the Antarctic Peninsula. We had to stand that all the time, but
it was clear to us that any insecurity that we felt because of having Foreign Office support
could only be removed by showing over the years that our science was more and more
relevant to environmental science, the subjects that we covered, and those subjects were
relevant to the rest of the world. And so we never rested on any link with the Foreign Office
and we never even mentioned it because it was not our business, but I do know that the
NERC consulted with the Foreign Office and said well – now here I’m guessing – is there
some way we could dump this lot and the Foreign Office would say no, as government policy
we must maintain a presence there. But we realised that there was some insecurity in that
because at any time the government could say well no, we’re not supporting them, we
want… we’re not going to support them. We think it’s a good thing but we’re not going to
continue to support you. And there were people in government who were very much of that
view, that BAS was costing a lot, NERC was costing a lot and the least relevant part that the
ordinary man in the street could see was to do with the Antarctic 15,000 miles away.

[0:52:30] And this did come to my attention once during the period when Jim Callaghan was
either Prime Minister or Foreign Minister, so I can’t put a date on it, but I was a great social friend of Brian Roberts who was the Antarctic desk in the Foreign Office at the time. Foreign Office Antarctic desk was only half-time job, it was the only high up post in the Foreign Office that was part-time, and the other part he spent at the Scott Polar. So he and I at that time were both bachelors and used to retire to his flat in Fen Causeway in Cambridge and he was very fond of his gin and tonic and since I had broader experience of the Antarctic than most people, we had a great deal to talk about. And we certainly talked about the fact that BAS had enemies and how important it was that we, for the Foreign Office, that we maintained a presence in the Antarctic and he had had to defend our position on a number of occasions, which luckily he could, because he was not a trained diplomat, he had been a member of the British Graham Land Expedition, that is the pre-war precursor of British Antarctic Survey, or the Falkland Islands Dependency Survey it was called. And so he knew both something about Antarctic science and he knew the politics because he was working representing our country and our interests in the Antarctic in the Foreign Office. And I do remember that one evening, late in the evening when we’d both had a lot of gin and tonic, and he did occasionally let things out that he shouldn’t have let out and this related to Jim Callaghan. All civil servants above a certain level are shown the particular minutes of Cabinet meetings that concern them, their department, so that they know which way the wind is blowing, which way the government is thinking. And he got access to all discussions about the Antarctic and of course those Cabinet minutes are secret, but shown to people who have clearance to see them. And in talking about the enemies of BAS he said well, there was one meeting where Jim Callaghan said well why don’t we dump the whole lot, this is costing us lots of money. I well remember that because he shouldn’t have told me, but it rings true.

[0:56:04]

And given that the insecurity in BAS over their situation and funding, to what extent was climate change, which begins to be a popular as well as a political debate in the period in which you were at BAS, to what extent was that used as a way of arguing for the relevance and importance of BAS?

Well, we had to argue for our relevance and one of the most important things is that the health of the Antarctic ice sheet is a principal factor controlling sea level over the world and the public had to be aware of that, made aware of that, which I worked hard on, because
instinctively you would say that’s many thousands of miles from here, I worry about sea
level round the coast of Britain. Well, it needed rubbing in that sea level round the coast of
Britain was a function of the state of the Antarctic ice sheet. So I always had to lay that on in
all my policy papers to NERC and I hope it was part of the argument and certainly still is and
more relevant with time in that there’s more awareness of climate change now and there’s
published papers right up until very recently on the predicted sea level rise from various bits
of the Antarctic melting.

_Do you remember – you say that you worked hard on pushing the awareness that the ice
sheet is linked to climate change and a principal component of sea level change being ninety-
nine per cent of the water balance…_

Well, about ninety per cent of the freshwater on the surface of the earth is in the Antarctic ice
sheet and the other ten per cent in Greenland. The liquid water on the earth’s surface – and
this comes as a shock to most people to know – add up all the lakes and all the rivers and
even throw in atmospheric moisture and soil moisture, comes to less than one per cent of the
freshwater on the surface of the earth. Ninety-nine per cent is ice, freshwater in a solid form.
And of course people say, what about Lake Baikal and the Great Lakes and everything?
Well, you can crank all those into the calculation and it still comes to less than one per cent
of what’s in the form of ice. But I mean we were finding this out by finding out how much
ice there was in the Antarctic. So probably when I started in the Antarctic I couldn’t
confidently say that, but as a result of the radio echo sounding we, both in the Antarctic and
Greenland, we were realising just how much ice there is. And BAS experience had been in
the Peninsula where most of the coastline’s made of rock. Well, round the rest of Antarctica
there are very few rock coastlines, it’s all ice. And so I had to get this across, that the
balance between coastal ice and seawater, depending on the temperature of the seawater and
the temperature of the ice, was far more important than people who had only worked in the
Antarctic Peninsula could understand.

[1:00:52]

_And when you say you had to work hard to get that across, did you have any involvement
with the press or with television or radio in terms of promoting this understanding of…_
No, we were not encouraged to talk to the press. We were not forbidden but we were not encouraged and the press was not all that interested. It was only later that climate change began to be discussed in a big way and then we did appear on radio and television to explain these relationships.

*Would that have been after you retired?*

Almost entirely. I do remember one or two television appearances before I retired and since they were non-controversial I don’t remember asking anyone’s permission to do it because it was my subject and I knew what I was talking about. But the situation is reversed now in that staff members are asked by the management to talk to the press and television. That’s a big turnaround.

[1:02:27]

*Thank you. This is after you retired, so I don’t know whether you were involved with it in the sorts of work that you carried on doing after you retired, but the International Hydrological Decade is mentioned in one of the papers of yours that I’ve read, 1983, could you tell me about that or any involvement that you had with that?*

Well, it was an international project lasting ten years, in the seventies I think, to assess the water balance, freshwater balance of the world and therefore there were projects in all the continents and just like the International Geophysical Year we were trying to make the same assessments of the same parameters in all countries. And of course we were very ignorant of the Antarctic because it’s such an enormous area and the research going on was so sparsely spread, sparsely distributed. So I do remember that people, I don’t know if it was NERC, said well what are you doing, every other continent is involved in this International Hydrological Decade, I don’t think NERC would have said you should be too, because they would know there was a cost implication [laughs] to anything they suggested, but in scientific forums we were certainly asked, what are you doing to support this international project. And a very, in many continents, study of smallish glaciers, that is, glaciers small enough to measure everything on, was part of the IHD. And we had very few local glaciers, I mean the Antarctic ice sheet is enormous and you couldn’t do any experiments to parallel those, what people were doing in other continents. So I chose in South Georgia island a local
glacier to send two people to measure its accumulation versus its run-off. In other words, what meteorological parameters were keeping it going and what were working against it and was it advancing or retreating and to explain that. And the same thing much further south in the Antarctic, on Alexander Island, where local glaciers, that is to say well defined – that have a beginning and an end – are much more difficult to find. There was luckily one quite close to Fossil Bluff which logistically meant we could get there with the aircraft and by surface travel from Fossil Bluff summer station and occasional winter station. And so I proposed that we have a couple of glaciologists winter on this glacier and measure everything, including ice thickness, which of course should for a long time have been the standard, but we didn’t have portable radio echo sounders normally supplied to glaciologists on the ground, it was a separate project. But as they were there for the winter and had plenty of time, I gave them a radio echo sounder, they had no deep drill; it would have been lovely to drill to the bottom and measure the temperature and annual accumulation deep down. They did drill to ten metres by hand. But having a whole year there, they were able to do a detailed radio echo map of the glacier bed and therefore the ice thickness and to get a very good handle on what was controlling the health of the glacier, same with the one in South Georgia. So these were our contributions to the International Hydrological Decade and I think – and we published the results and obviously ice is to do with hydrology but most of our work was far divorced from what people saw as hydrology in other continents, which was liquid water.

This involves going back chronologically, a bit of a jump, but as we’ve just spoken about that international effort to co-ordinate science, could I just ask you to tell me, because it’s a question I haven’t asked directly before, what you were doing at the time of the International Geophysical Year?

Yes. I had come back from the Norwegian-British-Swedish Expedition in 1952 and my boss, Valter Schytt, and I realised how much there was that was worth writing up, we had discovered an awful lot of new information, and he invited me to Sweden to spend a year working with him, which I did and had a good time there and I was fluent in Swedish so that was a great help. And then I realised that we’d divided up the material, but I, my half of it was enough to get a D.Phil at Oxford if I knew how to write it up and so a year was about
what was needed to co-ordinate and exchange bits, because we’d both taken part in
everything, so we exchanged and divided up the work. I went back to Oxford and spent two
years doing a D.Phil there and was given my D.Phil. And was supported by the expedition
and the University of Oxford while I was there and the end of that I got my degree and that
was that. And so I was without a job, so I had informed everybody in the polar world that I
was wanting to go on with polar work and just at that time the Canadians were short of
people willing to work in the Arctic. And so they wrote to the Scott Polar and said can you
find people who would be happy to work in the Arctic. Well that coincided with me needing
a job and they said what we would like is for somebody to study the distribution of pack ice
in the Northwest Passage because this is now becoming very relevant to the setting up of the
Distant Early Warning line of radar stations the whole way across from Greenland to Alaska.
And so I jumped at that and it was a two-year contract which I later stretched to four years by
convincing them that it was worthwhile and I had some initial guidance from the fact that
Terence Armstrong who was Deputy Head of Scott Polar at that time had made an ice atlas
for the Admiralty of the North East Passage, that is north of the Soviet Union. And that had
been published and so that gave me suggestions as to how to find out and how to present the
information, I mean information in all sorts of odd published and unpublished sources, how
do you make it accessible for people who need to judge the best time of the year to go to a
certain place. So I had that great help, but beyond that I had to devise my own system
entirely, research as to where sources of data were and how much was in Europe and how
much was in North America. And in the course of two years, which I stretched to four by
arguing that I was not wasting my time and working hard, I travelled 60,000 miles to access
the data in various libraries. And I got my expenses paid for that but I was working very
hard, totally alone, and had to travel with a lot of charts to plot my findings on from various
records. A lot of ships’ log books, but any other data source, books that I could find about
Arctic expeditions, you could make some sort of assumption that was better than nothing
about when there was ice, where in Arctic Canada. And I was told the limits of my study;
Icy Cape, Alaska, which is west of Point Barrow, and the coast of Greenland and this is a
tremendous coastline, and all the islands. So I was free to do what I liked and I found it
fascinating work so I just travelled where I needed to and submitted expense accounts to,
actually to Scott Polar because I was technically employed by the Scott Polar, who forwarded
them to Defence Research Board of Canada. [1:13:58] And so I was duly reimbursed, but
coming from a humble background I wasn’t going to five star hotels and things, I was going
to the minimum expense possible to get the work done, so there was never any demur about
my travel expenses. And I worked in Denmark because of the Greenland connection. The farthest west I went was the Hudson’s Bay Company in Winnipeg by then, although they had, most of their life was spent in, I mean hundreds of years based in London, but by then they’d moved their headquarters to Winnipeg. And so I went there for logbooks. But otherwise whaling logbooks, there are a series of whaling museums down the east coast of New England which is where whalers, initially Arctic and later Antarctic, were based. And so there are museums there with a lot of logbooks and that was fascinating because I had a general interest in the polar regions and could sometimes find people who would talk about them. A case in point was Stefansson, Dartmouth College, who had the largest private polar library in the world and I went there I suppose initially in 1955 or ’56 because the largest polar library in the world was obviously based, hoped to find data about ice distribution in the Arctic. And Stefansson was still alive at the time, overseeing his vast collection of polar books. That’s where I met my wife to be, Mary Fellows at the time, a widow, and that took some years to develop into a relationship leading to marriage for the simple reason that I wasn’t around, I was travelling. And I came back to Scott Polar in 1958 to do the writing up of this, having gathered all the data, to do the writing up in the Scott Polar. I did the writing up, I forwarded everything to Defence Research Board and they approved it and sent it to the Queen’s printer, that’s the government printer in Ottawa, who published it in 1960.

[1:16:57]

So in that case, your work with the Canadians coincided with the International Geophysical Year but was not connected with it?

Correct.

Did you, when you came back to finish the writing up at Scott Polar, were you aware of people working on things that were connected with the IGY?

Oh very much, because good friends were and I had been invited by the Americans to work at one of their stations in the Antarctic which is a tremendous privilege and a great surprise, but the reason was, that their Byrd people, two Byrd expeditions starting in ’29 and going into the 1930s, ’34, they had either died off or got beyond the age where they wanted to go to the Antarctic. And so who was there with recent experience of the Antarctic who had
published enough to have his name known, and I was one of the few. And so I was invited to 
be the station scientific leader of one of the American stations. At that time a man, Bill Field 
in the American Geographical Society in New York, had been delegated to search for people 
with experience in glaciology and so I was invited, I forget who actually signed the letter, to 
come with them. But that would have been in early 1957 when I was all signed on to do the 
Canadian job and later I was sought by the Australians to take charge of glaciology in 
Australia and for various reasons that didn’t – I never actually applied – that didn’t come off. 
And I would certainly have accepted the American invitation if I wasn’t already signed on 
for this Northwest Passage job because I had a great respect for what they’re doing and 
didn’t, had no terror about the prospect of working with foreigners, perhaps my upbringing 
and the fact that the Norwegian-British-Swedish Expedition had five nationalities involved. 
So I would have jumped at it if I wasn’t otherwise engaged. But as soon as I’d finished this 
work and handed in my material to the Scott Polar, my contract there came to an end in that I 
couldn’t legitimately ask for it to be continued, I’d done the job I was taken on for.

[1:00:20]

So then I needed a job and the Americans were doing a lot and I was well aware of what they 
were doing and I was also aware that they were short of experienced people. And so a man 
I’d met in a pub crawl in Cambridge had said during the pub crawl, if you ever need a job, let 
me know, and I didn’t think twice about it because that was while I was working with the 
Canadians. When the job expired I phoned him up at the University of Michigan and said, 
‘Do you remember that conversation we had in a pub in Cambridge when you told me if I 
ever needed a job, well I do’. And he did remember it, although we’d had a lot of beer, and 
he was in a position to do something about it. So he said, ‘Well I would like you to come 
over and work with me’ and being a scientific entrepreneur, an ‘operator’ in the words that 
Americans would use, in other words, understanding the system, he telephoned National 
Science Foundation in Washington and said, ‘Swithinbank is available and I want him, can 
you arrange to add that to my contract and so I can employ him’. Well, that took all of a 
week, after which he said come over. Now, a lot of people in Transatlantic business would 
have said, ‘Well if you pay for me’. Well I was not in a position to place any conditions on 
it, I needed a job, and so I paid for, paid my passage there and they didn’t help and I never 
dreamed that they should because I was taking on a job over there and I’ve got to be there to 
do it. So that was very natural that I went over and I forget how I crossed the Atlantic, but I 
did and ended up in Michigan and had a very happy three years working with this chap, Jim 
Zumberge, who as a great operator was moving up and up and becoming a Vice-Chancellor
of a new university and then a Vice-Chancellor of an older university, and ending up – I mean he left the University of Michigan and left me in charge of what he had been running – and he ended up as Chancellor, or President they call it, of the University of Southern California, and then he died.
Could I ask you to take yourself back to, this is sort of the early eighties, and you’re writing papers on various things including the Antarctic Peninsula research, glacier inventories, and you’re discussing satellites and you’re looking forward to two new kinds of technology that you think haven’t been exploited fully yet but are about to be. The first of those is satellite altimetry, could you tell me about any involvement at all in that and your view of it at the time?

No, but glaciologist friends. It was NASA Goddard Space Flight Center in Maryland that had access to the satellites. They realised that they had the ability to measure the height of the ice sheets to very fine level. Interpolating between the sea level, actual sea level on the coast as their reference horizons, and then multiple crossings and you could check the results you’d got from the first crossing when another orbit crossed it later at the crossing point, was a useful check on how accurate the thing was. So I was never involved myself but extremely keen that it should be done and the Americans had led the way and began pointing out that the Greenland ice sheet initially was, the surface level was lowering. But it was lowering by such a slow amount that there was obviously an argument about the errors involved in measuring it from satellite. People said well, is this accurate? Well, as time went by, of course, repeated passes were improving its ability to convince people that it was actually measuring what it was, the change in the height of the ice sheet. And so this has gone on ever since and is flourishing now many years later with more and more accurate satellites. So that in terms of the volume of the ice in the polar regions, we’ve got a better handle on it than we’ve ever had in the past and it is the satellite altimetry that provides the data.

Thank you. The second technology that you’re looking forward to the coming of is a French SPOT system satellite – did that happen?

SPOT satellite was higher resolution than Landsat. I think the resolution was ten metres instead of a hundred and obviously there was a lot more you could see in that and… but it was commercial and therefore expensive and my friends in Washington could not arrange for me to see it because they would have had to pay for it. I could have paid direct to the French
company in doing it, but it was lots of money because being high resolution, each picture
covered a small area and if you were interested in large areas that would have been
impossibly expensive. So I don’t remember ever buying any SPOT imagery, we made do
with the Landsat imagery for the good reason that I was getting it free of charge. But
certainly from then on glaciologists who were interested in a particular problem in a small
local area, they did buy a SPOT satellite image for that particular area because they could
afford one area.

[0:04:30]

*Were you getting the Landsat images free because of personal contacts in America or not, it’s just the way it was?*

No, I was getting them free for very good personal and professional reasons, that I had
provided what they asked in the way of the manuscript for a satellite image atlas for the
Antarctic and after that they were wanting to continue with Antarctic projects, Geological
Survey, I suppose all American departments really have to fight for their funding and they
have to have good arguments just the same as we do, and they realised that the coastline is
the most dynamic feature of the Antarctic ice sheet in that it advances as the ice moves
forward and then an iceberg breaks off and it appears to suddenly retreating, which it’s not
retreating, it’s just that a bit has broken off. And so it’s valuable to… there never had been
believable maps of the whole coast of Antarctica because people made maps at the point
where they landed, but between that there was nothing. But here were Landsat providing
continuous coastline the whole way round the continent, but as a spot in time and not
synchronous because of clouds and so on, and therefore any image that you used had to be,
have a date on it, the date it was taken and if there had been changes you could have an
apparent discontinuity in the coastline, which would be alright as long as the bits were
identified and dated separately. And therefore what was needed was a baseline outline of the
Antarctic as it was when the first Landsat images were available. And naturally, in terms of
interpreting what you could see in satellite images I was the obvious person to be involved,
and since I was already, had been collaborating with them they asked me I think as the only
foreigner at the time, yes certainly, to be involved with them. And this was probably after I
retired, but I realised the importance of it and was happy to be involved.
They realised that I had retired into a pension but they wanted a lot of work out of me and they had to face the difficult problem that although they had money and they were prepared to pay me, it was US government policy that they may not employ foreigners. And so they had to find some way round this and eventually did find a legal way round it, and that is that the US Army has outposts in Britain and part of their contract with the British government of being here is that they must spend a certain amount of money locally. Well they were not spending the whole of the amount that they’d been told to spend and so my friend in Geological Survey said well, I’ve got contacts in the US Army and we will offer to spend some for them on a useful project with an Englishman who has expertise in this particular area and it’s a programme that’s been justified with the US government. And so this was arranged and so I had a contract in the US Army in London and he arranged to send cheques from time to time. It was all a beautifully loose arrangement but the Americans knew that I was interested in doing the job and was not being paid to earn a living, it was just that they realised that it is fair if you’re going to employ somebody for a lot of work that he should have some reward. So this was arranged and I was, it was a contract for I forget what, perhaps two years or three years. Well of course the project went on because you got later imagery and you wanted to compare one coastline with another, so it was going to go on forever. But I’d signed a contract, must have been, must have been with the US Army, yes it was, US Army in London, for a certain period and that the US Geological Survey had to tell the army in London from time to time that I was doing the work and should therefore be paid according to the contract. Well, by the time the contract came to an end the work was going on and on and so each time I was going to be paid some money I had to say that I’d done all the work contracted for and the US Geological Survey had to say, yes he has. Well, they and I knew that I hadn’t finished, I’d done a decent day’s work though, and had been paid more for work that I hadn’t done. And again, this is an arrangement you can only come to with people you trust. The Geological Survey would have got into a pickle if anybody had said well he hasn’t actually worked these hours. Because they were signing to say I had and I was signing to say I had. But there was more work to do so I went on and I’m still involved in this series, many years after retiring, but not doing any work except checking on new map sheets when they come out, they send to everybody who’s been involved and I’m asked to comment on them. Well, I don’t need any money for that. So this arrangement is still going on, but with new satellites coming out, they have had Americans who had access to these satellites through having money and I didn’t have any money to buy them, but American,
various department, Geological Survey did, so they increased their number of collaborators and now there must be a dozen of us used at different times. But I had done the first coastline of the whole of Antarctica as a baseline, so that I’m still involved from that point of view and obviously want to see the sheets published.

[0:13:38]

*What year was that whole coastline, the first whole coastline mapped for?*

Done in bits and pieces from the introduction of Landsat.

’72 then, around that…

Yes, ’72 onwards. It took years to get coverage of the whole coastline.

*So once you’d put that whole coastline together, then now year by year people are comparing the change?*

Yeah.

[0:14:07]

*Thank you. Could you tell me about an episode which is recorded on Forty Years on Ice, but which you may be able to (a) give an account of for the recording and (b) expand on areas that you didn’t cover in your writing, and that’s the story of your voyage on the first British nuclear powered submarine?*

Yes, well the navy had never been under ice, under pack ice that is, and the Americans had, the Americans had been to the North Pole several times and it was natural that the navy should aspire to have the ability to go under ice because some war at some time might require it and anyway, it’s a good place, safe place for a submarine to go because it can’t be detected from above and could sit still under the ice and still be able to get into action when required. And so the Scott Polar was the obvious place to come. It was no good going to BAS because BAS had nothing to do with sea ice. But Gordon Robin, Director of the Scott
Polar, had been a submariner during the war and knew about submarines and I had spent four years working on pack ice in the Northwest Passage, so I knew about ice. And so the Scott Polar was the obvious place to come. So the captain of Dreadnought had sent the First Lieutenant, Robin Whiteside, to the Institute to ask about ice and he asked about pack ice and I said, ‘Well the Americans have been to the North Pole so a lot is known, you should be asking the Americans what it’s like to take a submarine underneath’. And he probably knew that answer already. And I said, ‘Well, where are you going?’ and he said, ‘I can’t tell you, all naval operations are secret before they go. And we got on very well because I did know a bit about sea ice by then and had read the American accounts of going to the North Pole and the fact that it was possible to find openings to come up through. You can’t push a submarine through the average thickness at the time, which is three metres of ice. You’d do a lot of damage to the submarine if you tried, you’ve got to find thin parts. Well I knew there were thin parts and even open water parts, even in the middle of winter, that you could come up. But for any submariner, the thought of being unable to come up at any time was rather terrifying because shut away in a steel tube under the sea they always… the thing you fear most in a submarine is fire, what can you do about a fire. Well, cruising along in the ocean at whatever depth you cruise along, you have controls like an aircraft, you can actually pull on the control column and shoot up to the surface if there’s any problem like a fire on board, open the hatches and get out and breathe some air. So at the back of their mind they’ve always had this comforting thought, that fire is terrible in a submarine and you’ve got to get out as soon as you can. And so I said well I think you, within an hour or two you should be able to find places to surface, anywhere in the Arctic Ocean, even in the middle of winter. This is what I’d read from the American reports. And of course he didn’t say what would have been going through his mind and that is, well that’s all too late if we have a fire, we’ll all be dead, but for me that was a satisfying, should be satisfying their view as to whether you’d be under this sort of concrete canopy you can never get through, that within an hour or two I said you’d always get through it. And so we got on very well and I provided lots of information and at the end of three hours he left and he’d already gone outside the door and he’d gone about six feet away and we were still talking and we were saying goodbye, as an afterthought he said, ‘You wouldn’t like to come with us would you?’ [0:19:35] And he got his answer in a microsecond and again, I was thankful for having the wife I had because I could go home and say I’ve been invited to go under the Arctic Ocean pack ice and she would have said, ‘Oh, good for you!’ And she did. But he said, ‘Well, we’re going in a couple of weeks, I’ve got to get security clearance for you’. And so I said, ‘Yes, alright, will
you work on that?’ But worst of all was that Dreadnought, in order for the Royal Navy to get a submarine quickly when they felt they needed one, they didn’t have any nuclear power station that would go, be as small as that and it would take time to design and build one, so they bought the nuclear power station and the bit for it to go in from the Americans, having been all secret, but given permission by the Americans to buy it from the reactor, it was from the Westinghouse Corporation. And so they got permission to buy all the parts that the Royal Navy didn’t know anything about; steam turbine, reactor and steam turbine and so on. And so the Americans had said well, everybody comes in them is to have security clearance, American security clearance, because we’re letting secrets out. Well, my British security clearance came through in time but not the American, so we sailed from… the place in the Clyde, submarine base in the Clyde, with me half cleared and at the back of the control room was a door going past the reactor and into the engine room and they said, ‘You must not go through this door’. Well, I accepted that and all the officers knew I was not cleared to go beyond that door and since the living accommodation was all not behind that door, it was on at least two decks if not three, I could go everywhere except the engine room and the reactor. And so I had the run of the ship as long as I didn’t go through this one door and was able to explore, go to the mess decks, talk to the sailors there. And the sailors were anxious, for reasons that I now understand, that in case of a fire what would happen. So again, having convinced the First Lieutenant, who had convinced the Captain, they asked me to go to the mess deck – I mean we were all committed and sailing out of the Clyde at this point – to go and talk to the sailors and answer their questions, which I did and very happy to do. And submariners are a cut above other sailors, they’re obviously very carefully selected because you can’t easily escape from your colleagues if you don’t like them, you’ve got to be pretty tolerant, and so I found them very easy to talk to and they were able to offer me a tin of beer, whereas when I was in the navy this would have been quite out of the question, having beer. But I was dining in the wardroom with the officers, but there were no spare berths in cabins, the thing was, the place was full and so I had to… they said we’ve got a place for you in the forward, the torpedo compartment, which again was not the American bit, and we can put a stretcher out there for you to sleep on in a sleeping bag. And they did, and I had a locker to put my things in, all in this torpedo compartment. It’s the biggest compartment in a submarine because you’ve got to have the storage torpedoes and get them through to push them into the torpedo tubes. And so they put up a stretcher between, in this rack of I think three high of torpedoes and this was alright as long as I slid in sideways and didn’t wake up with a start, in which case I’d hit my head on the torpedo above. And that wasn’t a problem
for me, I mean they were all very apologetic because they wanted to treat me as an officer and dining in the wardroom and so on, but living with sailors in the torpedo compartment. But that for me was perfectly alright because it was a fantastic privilege to be there anyway and I would have gone under any conditions. And as soon as I’d got up in the morning and dressed I would go up to the wardroom and have my meals with the officers.

[0:25:52] And we did come through the ice a number of times, each time with some anxiety to find an opening, which was always unpredictable, and then when you found an opening you only had upward looking echo sounders so you couldn’t tell whether the opening was linear, it might have been as little as ten yards wide, it would still record open water. But you can’t come up in that because one end of you is bound to be under the ice. So we would make three crossings, sixty degrees apart, of anything which we hoped was an area of open water, and then navigate back by dead reckoning to the middle of that pond, open water area, and come up vertically, and that’s what we did. Once or twice we had drifted perilously close to the side, which is very nerve-racking because you’ve got these hydroplanes sticking out: two forward and two aft, like control surfaces in an aircraft. Well, everything depends on being able to rotate those and use them as ailerons while you’re travelling, and coming up under ice, if you weren’t damn careful you could break them off and then you’d be in a real fix. And on one occasion we did, by the time we came up we’d drifted to the edge of this open area and had the bow under the ice, we didn’t know it, but the bow was under the ice. So aiming by pumping out seawater through the buoyancy tanks, aiming to come up like this, suddenly found ourselves tilting like that. Well the implication was obvious, that something was…

The front is going to…

…something was stopping the front come up. Well, it was obvious what it was so we went down and went round again to get back to the middle and came up. So we just had to be very sensitive about possibility of damaging the hydroplanes, and so we were very gentle. And… but we could come through ice, as I say, a foot thick or eighteen inches thick without doing any damage because you stow the periscope and actually the conning tower, or the sail as the Americans call it, has a steel covering which was not strong enough, we did actually bend it. And so you didn’t want to do any damage, but we didn’t do any serious damage and the periscope could still come up when we wanted it to. And also an exhaust pipe, because they
have diesel engines to use when they’re on the surface to give electrical power, and so as soon as we’d surfaced and everything opened up, they’d start up a diesel engine and we would be pumping diesel fumes into the atmosphere all the time we were surfaced.

0:29:28
And so I forget the exact number of surfacings we did, but one as near to the North Pole as our inertial navigation system could get us. I mean that was the most accurate system there was at the time, inertial navigation, and it, well it’s essentially dead reckoning system related to the direction you’ve been going and the time you’ve been going in that direction and calculating the co-ordinates. And so we were very, it must have been pretty close to the North Pole, and then we had to look for a thin enough place to come up in and that took an hour or two and we did and well, we couldn’t find an open area, we found an area with about a foot or eighteen inches of ice and we pushed through that. So at the North Pole we could get out and walk on the ice, no water visible, perfectly safely. I was worried because in certain places it appeared as if it might be thin and nobody wants to fall through ice at the North Pole, because we didn’t have life jackets or anything. So I discouraged people from gathering into groups where they might, combined, have enough weight to break it, but it was alright, nobody… we had a game of football on the surface. But it was pitch dark because the sun rises at the North Pole on twenty-first of March and we were there on the third of March. So we had moonlight and that’s all. And moonlight was good enough to see the hummocks on the ice and to walk around.

0:31:34
And all the voyage I had been checking the three upward looking echo sounders which gave the underside profile of the ice, just like our radio echo sounder had done with the bottom. And of course they had normal ones on the bottom where all sensible ships have them. And they, I had explained how important this was, because although the Americans had done many thousands of miles, they had kept it all secret, wouldn’t release it. And so we needed to have some British idea how thick the ice was, and so they said alright, well you look after it, what now would be called a very crude paper recorder, as trawlers would have had facing downwards at the time, and when the paper roll ran out you had to put on a new one. Well luckily we had sufficient overlap, they didn’t all run out at the same time and so I changed the paper and I had to make time marks to say exactly when we began and ended a given roll. And that was entirely successful; we had a continuous profile the whole way from the Clyde to the North Pole and back again, under the ice, well when we were out of the ice we switched these upward ones off because nothing to record. And I realised this was very
valuable and I prayed that they were not going to make it all secret and take it back and shut it away somewhere. And so I said, ‘Well is this going to be classified or not classified?’ and they said… I said well the Americans and the Russians have done thousands of miles of these upward looking sonar profiles and they know a great deal about the thickness of the ice from upward looking echo sounders, there’s no point in suddenly saying Admiralty, one line to the North Pole, we should make that one secret because we’d never get a two-way street going on that condition. And so I argued there was no point in this being secret and the Captain didn’t know because it had never been done before on a Royal Navy submarine and I argued for it to be unclassified and he said well, the rule in the Royal Navy is that if there’s anything that the Captain thinks might have security implications and doesn’t have any designated security classification, he must decide. And so having argued the point that there was no point in classifying it secret, then he said, ‘Alright Charles’. And so these rolls, dozens of rolls of paper, I threw into an empty mailbag and took back to Cambridge and spent some months analysing them and published the results. And they’re still in the Scott Polar. I did have one little problem and that is that to make the published results relevant I needed a track chart. Well our track chart was secret, so again, I had to argue for that. And eventually, by that time it was more than a year after we’d done and so they said, ‘Well, here’s the track chart but it’s secret’. So I… we’re not geared for classified information at the Scott Polar, I mean at that time we didn’t have any locks on anything, it’s an open access university library. So I mean I wouldn’t reveal this if a long time hadn’t passed since then and the fact that I, nobody else knew where it was in the Institute, I snipped all the secret red rubberstamps off the edge of these charts and published at a very small scale with the permission of the Admiralty. I sent my manuscript to the Admiralty and said I want to publish about this, of our track, and they said that’s alright. So you had these things to get over when working with the military but the Royal Navy was unfailingly kind to me in everything I did and when I wrote my book, there’s two chapters in the book, I naturally submitted them to Admiralty, saying have I said anything here which is sensitive. And they said no, go ahead. But in the Scott Polar at the time was a man called John Ash who’d been an officer on board Dreadnought years later and I naturally wanted any second opinion by someone who knew submarines, had I put my foot in - well had I said anything silly about how submarines work. And the Admiralty thought not, but he said well, ‘I don’t like your mentioning that these things, just mentioning that there are things that are secret’ and I said, ‘Well it’s been approved by Admiralty’ and he said, ‘But I don’t know if they know what they’re talking about. I think you should not mention this and that’. So, I cut them out of my
manuscript for the book, so there’s no mention of what is secret and what is not secret, although one of the photographs, there’s the control position like two pilots with their instruments in front of them which allow them to navigate, in other words, blind flying, but I was not allowed to photograph those except in harbour when you have visitors on board, wives come on board, they had screens in front of them, so when they put up the screens I said, ‘Now can I take a photo?’, and I think that’s in the book.

[0:39:29]

Which bits of text did you take out on the advice of that contact?

On the advice of that friend?

Yeah.

All mention of secret things.

Secret pieces of equipment?

[coughs] Yes, and documents.

Right. And when you spoke about cutting the red rubberstamps off, did you have to cut that off every single bit of paper that went through the recording machine for…

No, no, no.

Just the…

Because those didn’t have any navigation information on them, only times. So they were useless without the track chart.

Ah, of course, of course, I see.

And these track charts were at a scale of one to a million, and so there weren’t many of them.
I was wondering how for publication you managed to summarise the whole upward sounding profile from Scotland to the North Pole. Did you have to sample sections or...

No, I actually… yeah, I measured… ice thicknesses at intervals and I can’t remember what intervals. That would have been stated in my publications. So it was sampling in many, many places and so I plotted the underside of the ice, like this, very irregular. And so I had to devise my own means because the Americans had not told me how they’d done that. But I read a paper on these results at a sea ice conference in Reykjavik, Iceland a few years later and the American, who I knew had done more than anybody else of similar work before, he was there and of course we naturally had lots to talk about and I said well, my… I know you’ve done far more than I have and it would look rather silly if I published sections while knowing, but not knowing officially, that you’ve done a hell of a lot more than we have. And, because as a scientist you don’t like treading on other people’s toes just because you have a slight advantage of timing as I did, because mine weren’t classified. So I said, look here, I know you’d like to publish yours but you’re not allowed to, but if you really are about to get them declassified I will hold back until you’ve published them. And he said, ‘No Charles, you go ahead, publish, publish, publish. That’s the only way that we’ll get our people’s hands loosened on our own records’. So, thank goodness he said go ahead, you are not treading on my toes and I understand your position. And years later he did say that it had helped to loosen the classification.

[end of track 18]
Could I start by asking you today to describe your work in helping to assess the success of the voyage of the Manhattan through the Northwest Passage in 1969, if you could summarise that story?

Yes, I was invited out of the blue to go on that voyage because although we had people who knew a lot about ships and shipbuilding on board, BP as one of the three partners – it was Esso, BP and Atlantic Richfield - didn’t have anybody who had ever seen pack ice and I had spent years working on the pack ice in the Northwest Passage so knew what to expect and what they really wanted was to be told whether it was a normal season or exceptional. They had fears that Esso as the principal partners of the experiment might seek to paint it to be more of a success than it was in order to get big investments from Atlantic Richfield and BP to help construct specially made icebreaking supertankers. And so I was simply able to say after the event that it was a pretty normal, average ice season and so what we had found was typical of what you could expect to find at that time.

I was wondering whether you could tell me how the observations you made, and I think the measurements you made because at some points I think you went out on to the ice in front of the tanker, how did those observations and those measurements feed into your own, I think private designs and sketches and thoughts about the shape and the size and the reinforcement of a tanker capable of going through ice?

Well, the experts all designed conventional tankers with enormous horsepower. We had only 40,000 horsepower to drive the Manhattan and you would need, we concluded, something like quarter of a million horsepower to really go through ice and be sure of getting through. And I sketched a semi-submersible oil tanker in that it was the beam, the width of the ship that was hard to force through ice and if you could make it narrow and cut through like a knife and have all your cargo below sea level in a sort of… so talk about enormous submarine with a knife-shaped conning tower and that would be good but extremely difficult to operate because it would be particularly deep draught and it could be done, but best of all would be if it was crossing from Prudhoe Bay, Alaska to Europe via the North Pole because that’s where the oil was needed and where the price was higher and so that was another
consideration where you wouldn’t worry about the draught of the ship because the Arctic 
Ocean was very deep.

[0:04:16]

But we did have big team going out ahead of the ship to measure the thickness of the ice, the 
mechanical strength of the ice, ice temperature and in fact all the variables that you can think 
of in ice, before the ship charged through so that making our measurements ahead we laid out 
a line of bamboo stakes and then asked the captain to charge right at this line and proceed 
along that line so we knew the physical characteristics of the ice that we were ploughing 
through. And in the structure of the ship they had put 400 strain gauges at different places so 
that they could record the impacts and the flexing of the hull in relation to the icebreaking 
load.

[0:05:19]

*What did they conclude about the success of the Manhattan in moving through ice then based 
on those measurements and the response of the ship?*

Well, the summer experiment that I was involved with was a success but they decided they 
wanted to know about winter conditions so they did go later on a voyage, which I did not go 
on, in winter conditions and I never saw the results of that. I think there were still moves to 
construct a big icebreaking supertanker but they could never raise enough interest in other 
companies because it’s not something that any one company could possibly do by 
themselves, economically.

*Thank you.*

My electronic ear is whistling, I’m just wondering whether it…

[hearing aid switched off]

[0:06:20]

*Could I ask you to talk about the role of climate change in affecting and driving BAS’s self-
image and promotion of itself at the time that you retired and after? I wonder whether there*
were particular scientific measurements, particular scientific discoveries that were used by BAS in order to secure its position in terms of funding?

Well, the fact that the ice shelves, the floating glaciers in the Antarctic Peninsula where we worked were breaking up at a great rate was a very clear illustration of some change and there was an argument about whether it was climate change or just change of the seawater temperature because the… an ice shelf is balancing against warm seawater and so my work was to observe the changes and report the changes, but we couldn’t really explain them, we could only speculate, but the fact is they were major changes and they’re still going on today, and people better realise that something serious is happening even if it’s very difficult to explain. And it’s impossible not to link it with climate change.

Do you remember before you retired speaking to journalists or speaking to politicians about the relationship between Antarctic studies and climate change?

Certainly, but not to a great extent. BAS was not enthusiastic about publicity at that time. Since then they’ve become much more aware of the need for public scrutiny of what they do, but at the time we were not encouraged to talk to journalists, not forbidden, but not encouraged. And so certainly talking to politicians when I met them, which wasn’t very often, I would make the point and BAS funding has always been under threat from politicians and so it was necessary to support, defend our science whenever we had the opportunity.

[0:09:12]

I wonder whether you had any relations in BAS with Joseph Farman who had joined before you retired and I know was working in a different section, but I wonder whether you had any contact with him in terms of his work and measurements?

Well certainly I knew what Joe Farman was doing and he had a team of three people who were analysing the ozone observations that BAS had been making at a couple of stations for many years and it was these observations of a steady change, which the world had to be told about. He had a lot of resistance from other, possibly competing scientists who said that our instruments must have gone wrong or must have been drifting or something, because they couldn’t imagine that the ozone in the upper atmosphere was decreasing so much. And so
over the years Joe Farman’s major contribution was recognising, (a) that there’s nothing wrong with the observations and (b) that it must be something to do with atmospheric chemistry.

Was the discovery of what was called the ozone hole, what was the effect of that on BAS as an organisation?

It was good for funding because it was very serious and we were able to put our finger on the cause, the chlorofluorocarbon – CFCs, and actually get something done about it.

[0:11:09]

Thank you. I’d like to ask you about two key organisations in Antarctic science in the period in which you were working – the Antarctic Treaty and SCAR. I wonder if we could take one at a time and start with the Antarctic Treaty and I’d like you to, if possible, reflect on the way in which that treaty organised or structured Antarctic science in the period?

What it did was to keep it international. There’s always been a danger of politics and the claimants advancing their claims to the detriment of other people who want to go to their particular area and the Antarctic Treaty had a great deal of difficult negotiations before it was signed in December 1959 because countries which had claims didn’t want to give up any part of their claimed sovereignty and the clever thing about the wording of the Antarctic Treaty is that it does not officially affect claims of sovereignty, no claims have been abrogated, withdrawn. On the other hand the difficulties about sovereignty anywhere are controlling who comes and goes and that was signed away so that claimants have no control over who comes and goes to their territory, which as far as a scientist is concerned is ideal. I mean it’s bad enough having to get support for Antarctic work but if you have to go through a foreign government whose interests are not in science but in asserting its sovereignty, that would be very difficult and all that was overcome by the Antarctic Treaty.

So having worked before and after, was there a noticeable change in freedom of access for science after the Treaty was...
No, because the Treaty was an outcome of the International Geophysical Year during which these national defences had been laid down in the interests of science so it was a wonderful precedent but we wanted it to continue because it had been such a success that people, scientists could go anywhere their experiments demanded without asking permission of any claimant power and we all recognised this tremendous advantage and so we wanted to perpetuate it.

[0:14:19]

*Thank you. And could you talk about the role of SCAR in the period?*

SCAR was separate from the Treaty because it was entirely science, although that wasn’t always easy to organise in that science in the South American countries, particularly Argentina and Chile, was a very, very poor relation to the military and in fact the supposedly scientific institutes in Buenos Aires and Santiago were both arms of the national military. And so their priorities were clear and in the early years we tried to get entirely scientists involved with the Treaty, but Argentina and Chile in particular didn’t have enough scientists and sent military men who were really incompetent to talk about the science and not interested anyway, they were interested in whether SCAR would attempt to weaken their presence in the Antarctic. And this gradually got rather absurd with politicians completely unable to talk about science because they were not scientists and they were sitting at the back of the room recording everything, but from the point of view of a scientific gathering, it was silly and I think eventually they realised that and although the scientists are, in South America, are under control of the military, they are real scientists now.

*Did you attend any SCAR meetings?*

I did. Now which did I attend? I attended one in Australia and one in Argentina as far as I remember and, yes, those are the two I attended, but I’d been a hanger-on even before the IGY in terms of knowing some of the people involved and attending the pre-IGY conferences; Stockholm notably, I remember. But that was the total of my involvement.

*Could you remember the year that the Australian SCAR conference was held, the one you went to?*
I don’t remember the year, no, this is all a long time ago.

*That’s fine. Do you know roughly?*

Oh it would be in the sixties.

[0:17:22]

*Now obviously there are very few accounts of what one of those meetings would have looked like, how it was organised, that sort of thing, so anything you can remember about, for example, the Australian meeting, you know, what happened, who was doing what, that would be useful.*

No, I can’t remember much about the Australian meeting in that it was about science and therefore it was obvious what we were discussing, we had a lot of common interests. What I do remember is the Argentine meeting in that there was a very strong presence of the Argentine army and we were subjected to a great demonstration of Argentine army strength, which was totally irrelevant to what the rest of us saw as being the purpose of the Treaty. But they with a military government obviously wanted to rub in the fact that nobody was going to tell them what to do in their territory as they saw it. But this was totally out of place in a scientific meeting, but they… that’s the way they were working because their scientists were working under the military.

*So when you arrived for that conference, how was that military display set up, how was it made apparent to you?*

A lot of military presence, but then the host country normally demonstrates something nice about its country, but this was clearly to demonstrate the military power of Argentina and the Falklands didn’t specifically get mentioned, but clearly that was in the background of the Argentine minds.

*Was this before or after the conflict?*
Before.

Yeah. Thank you.

[0:19:49]

*And the discussions at these conferences, obviously they're about Antarctic science, but any aspect in particular given that this is an international organisation?*

Well I was a member of the Glaciology Working Group and there were working groups for each major discipline of Antarctic research and it was easy in that we were not opposing each other, it was not difficult to get agreement about things we should be studying. And so the glaciology meetings were always interesting renewal of friendships of people you’d worked with and intended to work with in the future. So specifics apart from the conference we had in Cambridge of the Working Group on Glaciology when I was secretary, that started a major international programme in the Antarctic Peninsula which I felt had been somewhat bypassed by glaciology, because it’s a difficult area to work, but for years I was the British representative on the Glaciology Working Group.

*And what sorts of things, leaving aside the Antarctic Peninsula because we’ve discussed that before and I know that that was successful in generating international co-operation, what other sorts of things were you able to achieve through being on that working group for SCAR that you think you couldn’t have achieved without it?*

Co-ordination was at the nub of it, that we were always encouraging the other countries to get more involved than we were, because some of them were very little involved with glaciology. In fact the South American countries it was extremely difficult to get them to employ a single glaciologist. But in terms of what should be done, we had an extraordinary level of agreement.

*Was it about co-ordinating measurements across Antarctica at the same sort of times or was it about different nations pooling resources on a particular project in a particular place, can you remember specific things that were achieved?*
A bit of both, so it was co-ordination of national efforts and then an attempt to get international projects going where for logistic reasons the interior of Antarctica, no one country could afford to go it alone. So we did and there were big international projects which slowly matured. One was called IAGP – International Antarctic Glaciological Project – which had European, a number of European countries involved and Australia. So the aim was always to do the difficult things which could not be done by one country for financial reasons.

*Do you remember what the aims of the IAGP were in particular?*

Palaeoclimatic drilling was at the centre of it, that it was becoming more and more clear that understanding climate change was very important. Not simply the climate change that had occurred in the Antarctic, but the climate change, the world climate change. So the first deep drill holes for charting climatic changes over the last 100,000 years were done in Greenland and they were such a success in showing what the northern hemisphere had been through in terms of climate change that we were very anxious to do it in the Antarctic to see whether these were global changes. And so this was an early attempt to get things done and the Russians had beaten us all by jointly with the French, drilling a very deep hole at Vostok, 4,000 metres, and distributing the core to French and Russian scientists to chart the glaciations in the last several hundred thousand years. And then the question arose, was this typical for Antarctica, for that part of Antarctica, or were there wide differences, and this again promoted the wish to know whether any part of the ice sheet was unstable from drilling history. Now this is still going on well into the twenty-first century, drilling in more places because we’ve found that it is not uniform over the continent and quite big regional variations due to local climatic effect.

[0:26:12]

*And why was it necessary to, through SCAR, enlist international co-operation for the drilling of cores? What about that activity made it necessary?*

Cost. Very expensive and getting the best scientists involved with the analysis, regardless of whether it was the country able physically to do the drilling, you want the very best people involved in analysing it and so it was very collaborative and it’s gone on to this day, these
major collaborative programmes between glaciologists in a number of countries and it’s been a great success because no one country could have afforded it by themselves.

So the working group was then partly about arranging for different countries to fund a single project…

Yes.

…to put money into a pot? And at this time, who were the experts in the analysis of palaeoclimate through ice cores that you would want to be working on the analysis whether or not their particular country had paid for the drill bit or the…

Belgian, French, American were probably in the lead and at the same time the British glaciological effort was developing and in the last thirty years has become crucial as the others were in leading the way. [coughs]

And in a project like the IAGP, how was national funding decided? I mean one model might be that everyone pays the same, but if that wasn’t the case, how was the relative contribution established?

I think each country paid what it could, but then with all Antarctic fieldwork, the biggest cost is logistics, getting people and equipment to where you want them, that is ships and aircraft, notably aircraft if you’re working inland. And some countries have much more ability than others, notably the Americans do, and whereas other countries have smaller aircraft which are more versatile, don’t use so much fuel, so what has become quite common is the Americans contributing fuel flown in to the place in Antarctic where you’re going to drill by their large Hercules aircraft and then BAS and the French doing the small aircraft flying with the instruments, in other words, doing the science. But the Americans of course don’t want to be left out of the science so they have been involved as well. So the logistic collaboration is excellent, that countries do what they can and not just funding, but in terms of ability and experience. The operations are very difficult in extremely cold weather inland and there was one a few years ago led by Eric Wolff, a BAS glaciological chemist, which was a great success of several countries involved.
When you were the British representative on the Glaciological Working Group of SCAR, do you remember who was the American representative and the French representative and the Belgian at that time?

You’re asking a lot for me to remember because this is a long time ago, but the American would have been Charles Bentley of the University of Wisconsin, Dick Cameron who later became Head of Glaciology in the National Science Foundation in Washington. In the early years a Belgian chemist called Picciotto led the way in isotope understanding of ice cores, and a Dane, whose name I’m struggling to remember, developed that ability for deep ice cores so that the Danes were always involved and the Danes were after the first few years jointly involved in the Scott Polar radio echo sounding programme. Australians did good work in their own area but at the time were not great collaborators internationally, but were doing extremely good work. So names are difficult to remember at this stage of my life.

Yes, thank you. Could I ask you now about another project which I know had connections with SCAR, and that is the… your work post-retirement in producing an Antarctic Digital Database through connections with SCAR and the World Conservation Monitoring Centre and BAS I think. I wonder if you could start by summarising the history of that project and then we’ll follow up on some details.

Well, initially BAS were asked if they would like to be involved and they declined, so it fell to me to make a start on it and we had private commercial funding from people who were making a digital database of all continents, it was an oil geophysical company supported by the oil industry. And of course that horrified some people because we did not want any oil development in the Antarctic. But as far as we were concerned it was simply the source of money to get going and we got going on that and then BAS changed its director and became positive about collaborating with this work and so BAS, because of their great resources, quickly buried the Scott Polar effort because they were putting a lot more resources into it. And the World Conservation Monitoring Service were interested because they were doing the same with all the world producing a baseline digital maps on which they could plot the
distributions of whatever they were interested in, that is vegetation and birds and wildlife. So
the three organisations got together, the Scott Polar was me and I had no funding and so the
other two organisations quickly overtook us, which I was delighted because they had not
come in on the beginning but we’d got the thing moving. And we got a big grant from BP,
again, an oil company but we were nothing to do with oil but BP have funded quite a lot of
databases, geographical databases, so we were not averse to taking money from them. So
that was big money compared with anything that I had access to in the beginning and it took
off from there and we collaborated until the thing was published and we decided that SCAR
should be responsible for it so that everybody had access to it and it’s now been through
revisions and is very widely used as a database for geographical information systems, maps,
through all SCAR countries. In fact it’s easy to access and it’s free of charge.

So did SCAR come in at the end then in terms of publishing it and making it available to…

SCAR came in, well we were wondering who should look after it permanently and SCAR
was the obvious organisation to do it so that everybody had access to it and this had the
advantage of producing a lot of people interested in its possibilities of such a geographical
database and although BAS had been doing most of the work in updating it, SCAR is legally
the publisher of the database.

I see, thank you. Do you know which oil company it was in the beginning who approached
BAS to…

They didn’t… I’m struggling to think. It was an American geophysical, oil geophysical
company and I forget the name.

In which case they may not have named the company that they were working for I suppose, if
they were an independent geophysical…

They may not, but I think they were doing something that all oil companies been interested in
and that is having a geographical database of the globe.

Yes, yes. And so when they approached BAS, the director at that time was? Would that have
been Dick Laws at that time?
I think it was probably Dick Laws, yes.

[0:38:07]

*And do you remember the grounds on which they declined to take part at that stage?*

Probably they had other interests. I mean it was quite a long way off anything that BAS had been involved in and BAS was very dug in in its own research programmes.

*And then BAS said no and then they went to the Scott Polar and that’s how…*

Yes.

*Yeah. Could you then describe what your work on the database involved?*

We had only one employee at the time and she was put on to making a base map of the Antarctic and into listing and plotting what national cartographic organisations had produced in the way of maps of different scales of different areas. And that was quite a big job, to plot that and find what areas had been covered at what scale. And it was at that point that we tried to get others involved and eventually I think it was probably the change of director of BAS to David Drewry who realised that BAS should be involved and should be contributing to this. And together with WCMC and myself representing Scott Polar, the three of us went to BP in London and tried to sell this to them. Well, it was successful and we got considerable support.

*Did you do any of the… you said that there was a female employee, do you remember who that was, who worked on the plotting of existing maps?*

Forgotten her name. She’s married and changed her name.

*And did you do any of the searching out of maps and plotting and that sort of thing?*
Well I don’t think I did because I was involved at the same time with the US Geological Survey for a long period, I mean more than ten years, of plotting the boundaries of the ice sheet all round the Antarctic from satellite images. Well naturally, I had taken an interest in what published maps there were because we needed ground control, so to speak, for hanging my work from satellite images and so I was very familiar with the mapping of all Antarctic countries.

[0:41:27]

Yes, thank you. Okay, now another post retirement activity has been your work in supporting non-governmental flights across and to Antarctica. I wonder if you could, from retirement onwards – in fact I think that you were approached for this work before retirement but only took it on after retirement, is that right?

Yes. I knew that BAS would not be enthusiastic about working with a commercial organisation. BAS has had an aversion to commercial organisations. But it was a BAS pilot who I’d flown with in my BAS work who had been drawn in as an experienced Antarctic pilot to a very small company called Adventure Network International that wanted to take mountaineers to the Antarctic [coughs] because there are many unclimbed mountains there and it was impossible to pay governments to take you there because they were not interested in private expeditions in mountaineering. And so this ex-BAS pilot called Giles Kershaw was approached by the Adventure Network company, which at the time was Canadian based, and asked if he would fly mountaineers down there. Well, he only had access to chartered Twin Otter aircraft which are short range aircraft and involved going 1500 miles south of South America, and that involved getting collaboration from other countries in terms of providing fuel. Well, BAS did not provide fuel but the Argentines and Chileans were interested, not because of the mountaineering, but because of wishing to develop their logistic capability in the Antarctic and here was people who were pioneering much further south than those countries had worked in, further and further south than BAS had generally worked and you needed experienced people to do this, it’s not something you could simply send a pilot off to do because the difficulties are quite unique, no navigation aids, no known places to land, some places to land, national stations, others don’t want you. And so it was a pioneering effort but paid for by mountaineers. And that’s been going on ever since because mountaineers seem to be able to get hold of sponsorship by newspapers and the particular
attraction of the Antarctic is that people who have climbed the highest mountain in all the other continents think that their next achievement must be to climb the highest mountain in every continent and that involves going to the seventh continent, Antarctica, which is the most difficult and the most expensive for them to get to, although climbing Everest is very expensive nowadays because of… the Nepal government charge a lot.

And Giles Kershaw and I, while doing radio echo sounding for BAS in 1975, had seen an area of bare ice. Well, you don’t need bare ice for ski-equipped Twin Otters, but there are no large civil aircraft on skis that you can buy. The American military have Hercules on skis but they have arranged that, I suppose for military reasons, the Lockheed company that make the Hercules were not allowed to sell ski Hercules to any other country and so that was ruled out. So there were no aircraft bigger than a Twin Otter with skis and so the obvious thing is well can you use wheels, in other words, a totally unmodified normal four-engine airliner which would have the range necessary to do it. And Giles, I think within a week after I retired, said well we’re going with our Twin Otter because we’ve been before, paid for by mountaineers, but did I remember this piece of ice that we had seen and not even mentioned to each other, in the Ellsworth Mountains, which appeared flat and bare, and he said, ‘Do you remember that?’ and I said, ‘Yes I do’. And he said, ‘Do you think it would be good enough to land a four-engine wheeled aircraft on?’ And I said, ‘Well you won’t know until you’ve surveyed it to make sure it’s flat’. And I thought that was the end of it but he then said, ‘Would you come and do it, would you come and survey it?’ And so within I think a month after retiring I was on my way to Antarctica with Giles Kershaw flying a Twin Otter chartered from a Canadian company and paid for by half a dozen mountaineers, including some of the top mountaineers in the world. And so I did, I was the only non-climber there. It was a very difficult trip because we had to have fuel from the Chilean government, again, why were they interested? They were interested because we were doing something that they were interested in but knew they were not competent to do. And then they supplied fuel at two places en route and we had to put out fuel at one other place. And delivered these mountaineers to the base camp at Mount Vinson, the highest mountain in the Antarctic, and then flew off to the place that Giles Kershaw and I had seen all those years before, and landed me there with just one assistant, who was actually a geophysicist but he was there, not there on… not there for science, he was there for the fun of getting to the Antarctic. And we camped in a small tent and I used a borrowed theodolite and a borrowed four-metre staff and we ran a line of levels along this bare ice area. Well the bare ice area was much bigger than
you needed to land even a big aircraft, but the wind was exactly at right angles to the runway, which is a great drawback of course, pilots don’t like that and with any type of aircraft there’s a crosswind limit that they’re allowed to land with for safety reasons. But in the Antarctic they just had to judge this. And so we had to land, even with a Twin Otter we had to land into wind which meant a mountain 500 yards ahead of us, which instinctively pilots don’t like because it makes it difficult to go around if you don’t get the thing on the ground.

But we did it, we surveyed it and because of Chilean collaboration they had done an airdrop of fuel for us. I forget, I think we paid them 60,000 dollars I remember for doing an airdrop from a Hercules, military Hercules. And that was because they had an interest in what we were doing. So when we had done this season with the climbers, in fact during the season, two Chilean Air Force Twin Otters flew to the Ellsworth Mountains, which was a tremendous adventure for them because they’d never been that far south and they just were not familiar with it at all, and camped beside us, very friendly because we had a friendly contact in the Chilean military. But they were clearly very interested in how to operate that far south on skis or wheels or whatever we landed up doing. And after this season I delivered my report on the levelling work to Adventure Network and to the Chilean Air Force because they had helped and collaborated and I thought it only fair that they should know exactly what I had concluded. Well what I concluded is that we’d found a piece of ice big enough to land large wheeled aircraft on, with the drawback, unfortunate drawback, that there was a crosswind, but that didn’t prevent you from landing when there was not a strong crosswind. And so the Chileans wanted to stay involved and I thought that was that and on the way home I had been introduced by our Chilean Air Force contact to the head of the Chilean Air Force who was one of the members of the military junta, but turned out to be very friendly chap, fluent English, and so expressed his interest in what we were doing. So I made sure they were kept in the loop about what we were doing because we stood to gain by collaborating with them. And after getting home from that trip I thought well, that’s the end of it for me, I’m an old man, but not long after getting home I had a telephone call from I think Giles Kershaw saying we have chartered a four-engine airliner, a DC4 and we’re going to take more mountaineers the whole way without stopping. And I said yes, and he said, ‘Well would you come with us?’ Well I couldn’t see much point in that because I’d made my report, but obviously they wanted somebody who’s unafraid to land on this bit of ice where no big aircraft had landed on before and so I agreed to go with them and I joined them in Punta Arenas and we flew to the Chilean base on King George Island. We flew some fuel
in there, mainly for coming back. But the first flight to this place called Patriot Hills ice field was non-stop from Punta Arenas. It took us eleven and a half hours to get there and it was amazing that they had on board enough fuel to get back after that, so they were carrying more than twenty-four hours of fuel and a lot of cargo as well, which I greatly admired. And again, the Chileans wanted to see what we were up to and they’d sent ahead two Chilean Air Force Twin Otters to land at the ice field to witness our landing. And there were, they told us afterwards, dire predictions that we would crash because this hadn’t been done before. But I was totally confident that it would be alright, as indeed it was. First landing was perfectly alright, but it was witnessed by probably eight members of the Chilean Air Force as well as Adventure Network’s own people who’d gone ahead in a Twin Otter to be a weather station, essentially, and that was a great success. And so for a couple of years after that I think they used a DC-4 and then they upped it to a DC-6 and then they upped it to a Hercules, they asked me to go on the first Hercules flight, which I did, and then they upped it to a giant Russian four-engine formerly military jet, the Ilyushin-76 long range, which they’re still using today.

[0:56:25]

*Thank you. Could I ask you first of all, in the beginning how you felt about the role of this in potentially opening up Antarctica to further adventurous tourism?*

Well my mind was not on adventurous tourism, but in terms of science, it had always been difficult to get access inland with aircraft that could carry enough and since the American ski Hercules were the only big aircraft working in places where there was snow, which is most of Antarctica, ninety-nine per cent of the area, if there were other areas of bare ice there would undoubtedly be people wanting to get there. And it was on the way home from the first DC-4 season that I visited old friends in Hanover, New Hampshire, the US Army Cold Regions Research and Engineering Lab. I had a contact there, Malcolm Mellor, who was English but had become an American and so I just thought it interesting to show him the photos of a four-engine aircraft on wheels landing in the Antarctic. Well, he was very surprised to hear that we had done it because everything else was done by governments and this was a non-government affair and he arranged actually on the spot to convene a meeting of the highest officials of this military organisation to cross-examine me about what we’d done, and I had photographs. And they were very impressed and they told National Science
Foundation who were the people who funded American Antarctic research, that it would be very nice for them to have their own blue ice airfields, as we called them, and they knew the particular interest to the Americans was that it’s 800 miles from McMurdo Station to the South Pole and the Hercules they use on skis don’t carry very big loads, so they need hundreds of flights from McMurdo every year to keep the South Pole research station operating and if there was a cheaper way of doing it they would like to know about it and of course that would be a blue ice airfield. And it was very interesting because the… no, my talk with the head of the Chilean Air Force was before the DC-4, it was after the Twin Otter season and we had very easily convinced him that this was something worth doing, but before the DC-4 season we were told by our Chilean retired Air Force General friend that the Americans had tried hard through diplomatic channels to stop our flight on the grounds that they were the only organisation capable of coming in to get us if we crashed, and they assumed that we would because this was so unconventional. And so when we came with the DC-4 the next year, we were told afterwards that probably the State Department had asked their Ambassador in Santiago to refuse permission for us to take off from Chile. Any sovereign country has the right to stop intercontinental flights taking off from its territory if it thinks they’re unsafe, and the Americans thought it very unsafe. On their side I can say that they were particularly sensitised by the crash of an Air New Zealand DC-10 carrying tourists from New Zealand on a day trip to McMurdo, just sightseeing trip which had flown in and killed 270 people and the Americans had been landed with the search and rescue job which delayed their science for, well took up most of their science for their logistics for the whole year. In other words, be extremely expensive for the American taxpayer and had no advantage for science. So they were terrified of non-government flying and that was the context in which they wanted to stop us going. But because we had talked with the head of the Chilean Air Force and he was obviously interested in what we were doing in terms of leading the way for Chile to venture further south, that he told the American Ambassador in Santiago, well I don’t know what polite or impolite words he used, but he said no, we’re not going to stop these people.

[1:02:45]

Thank you. Given then, I know that you said the Americans were sensitised by this crash, but given the fact that the Americans didn’t think it was safe, what made you feel that it was?
What was the nature of the observations that you’d made or the things that you’d seen, the measurements that you’d taken that made you…

There was a large area of bare ice about as hard as concrete which we had surveyed to show it was flat, and so not knowing more than anybody does about aviation, a wheeled aircraft can land on a large area of flat, hard surface wherever it is. Simple as that.

[01:03:33]

Thank you. Now I know that your aim, as you’ve said, wasn’t to develop tourism, but through working with ANI you could develop the landing of wheeled aircraft in Antarctica for all sorts of reasons, including science, but did you, I wonder, have any reservations about the by-product of this being an opening up of Antarctica to various kinds of activity over which you’d have no future control?

I didn’t because the people doing it, Adventure Network, were environmentally more sensitive than the government because what they were selling was a wilderness experience and the governments assumed a commercial organisation would leave empty Coke cans all over the place because they would be only interested in getting people there and back. But as it turned out they have been extremely responsible about all their waste and they operate the cleanest camp in the Antarctic and they have for more than twenty years now, and the only camp from which all waste except liquids are flown out of the Antarctic back to South America. So no government operation does anything like that, but because they’re flying in with aircraft and flying out empty it’s no trouble at all for them to do this and so they set a very fine example of not leaving messes inland. When I was working with the Americans in 1978, just for a summer as a guest, their camps were throwing all our waste over a cliff on to a glacier on the grounds that it was a very small amount, it was a very big area and as likely as not nobody would ever find it and if it landed on a glacier would be carried away to sea. So that now would be very seriously frowned upon. The Americans are trying to be as clean as anyone else, but they have to be not too holier than thou in that their big South Pole station is burying all its human waste in the ice at the South Pole, it would be too much to carry out. Their standard of living requires that they have flush toilets at the South Pole and of course are producing therefore enormous amount of liquid waste carrying the solid waste with it and so everybody knows that they do this and everybody knows that it would be virtually
impossible to clean that up because there’s so much of it. And the hope is that it will stay below the surface for the whole few thousand years until it reaches the sea and therefore will only be spilled into the ocean where there’s a lot of human waste anyway. But they are now very sensitive about not burying anything else other than human waste and washing-up water and they fly out absolutely everything after all containers and dangerous chemicals are carefully handled and flown out of Antarctica. Well they’re flown to McMurdo and then put on ships, carried out, out of Antarctica so more and more people are very sensitive. In the earlier years when I was working with the Americans, 1960, McMurdo, their main station was like a frontier town, a mining town in the wilderness and nobody cared about anything except getting the job done and so hundreds of tons of rubbish, empty tins and so on was bulldozed into the sea. Well, thank goodness that’s historical fact now, it’s superseded and they don’t do that at all; they incinerate some and fly out other things, particularly harmful chemicals. But that was quite normal at the time to accumulate rubbish and BAS was doing the same with empty fuel drums at two places: Adelaide Station and Fossil Bluff. Well, Adelaide Station has now been handed over to the Chileans which – and the British I think have used it as a lovely excuse for not clearing up the British mess – but Fossil Bluff was entirely British and they have flown out all the rubbish they can still dig up, at a tremendous expense to the taxpayer but all in the interests of keeping the place clean.

[end of track 19]
Governments, particularly, not the South American governments, who were using Adventure Network to lead the way to places they wanted to get to, governments had been concerned with the effects of tourism in terms of pollution, as I said, live in fear that Coca-Cola cans would be left in the Antarctic. A man called Bob Headland, who is involved with the cruise ship industry as a lecturer, as I have been, but I’m no longer, and he is a scholar and he published a paper calculating the amount of pollution in the Antarctic contributed by tourism versus governments and concluded that ninety-eight per cent of the contamination was due to government operations.

Thank you. What was the reason for BAS’s opposition to the opening up of tourism or your work on airstrips at the time, this time?

Well you see as scientists we had had the privilege of being the sole occupiers of the Antarctic and government negotiations could settle everything, and here was an independent organisation coming in with no interest in scientific research, bringing a commercial element, and I think the fear of being involved in expensive search and rescue was always with them. And naturally having been on both sides of the fence, the very first time I went down I said to these people that if you ever have to call for government rescue if you crash an aircraft or something, you will have all the governments doing everything possible to stop you working in the Antarctic. You must be prepared to get your people out if any one of your aircraft, even the biggest aircraft crashes, you’ve got to get the people out without calling on government help. And they have abided by this for twenty years now without calling on government help, and they’ve had some accidents, they’ve had aircraft blown away. They had a commercial DC-6 of a company that had worked for Adventure Network and then struck out on its own, it crashed and Adventure Network realised that it couldn’t wash its hands and say well that’s not our department, we are trying not to use government help, and so they picked up the pieces of this, the number of injured people in this DC-10 crash and flew them all back to hospital in South America, so governments were not involved in that. And that company folded because it was the only aircraft they had. There is now a Russian company that is involved in operating out of Cape Town. Adventure Network pioneered the
route out of Cape Town, I was on the first flight, a chartered American wheeled Hercules, commercial, flying non-stop from Cape Town to an ice field that Adventure Network had discovered – well, I had discovered it on satellite pictures initially and Adventure Network sent a Twin Otter round there to survey it with a professional surveyor, who is still involved with them a good many years afterward. So again, these Americans with their Hercules costing fifty or a hundred million dollars were a little nervous about taking it there to land on a piece of ice as they’d never landed on ice before and they’d never been to Antarctic before, so they said would I come along. So just the same as the first DC-4 flight, they positioned me in the jump seat between the two pilots to try to stop them doing anything silly. Well, they certainly didn’t do anything silly and it was a beautiful strip of ice and there were absolutely no problems and they flew there many times later. But then if you’re travelling over intercontinental distances you’ve got to think what you would do if your destination airfield was under the weather when you got there. You’d have to have somewhere to divert to. So Adventure Network sent a professional surveyor with a Twin Otter to look for places which I had identified on satellite images and to survey them and make sure that they would serve in emergency to divert the aircraft which would not have had the range to go back to Cape Town. And so they now have two other places within a few hundred miles, but likely to be out of the same weather system, which they could divert to if they had to.

[0:06:44]

I wonder whether former colleagues at BAS or your contacts at the NSF ever told you what they thought of the work that you were doing with ice fields or...
you can go to hell, because fuel at the South Pole costs more than whisky, Scotch whisky in Cambridge. But they didn’t and they were very surprised that I didn’t want a team with me and… but they didn’t question me because they knew I’d had decades of experience in the Antarctic. But I was pretty certain that if I needed people to come camping with me I would have volunteers from the South Pole and that turned out to be the case, excessive number of volunteers when it came to the point. But we didn’t know what we would find, except that I had spent some months going over aerial photographs in the American collection of the US Geological Survey to decide on places worth looking at. Well the aerial photographs were taken from 20,000 feet so you couldn’t tell anything about the slope, you could tell it was bare ice, you couldn’t see small crevasses which would wreck an aircraft so you had to get close to it. Twin Otter was ideal and so I had organised priority routing to use as little fuel as possible and take us to as many of these possible sites as we could and we found two sites which were long enough and smooth enough to land large aircraft and before we landed we… we’d taken off from the South Pole on skis in the Twin Otter and when we saw from the air that a place looked good, I said I wanted to fly over the length of an imagined runway to see how long it was and what the slope was. And so with a stopwatch we looked at the pressure altimeter at the beginning of this supposed runway and timed the progress, asking the pilots to hold thirty feet off the ground exactly. And then at the other end, stopwatch told us how far we’d flown and the altimeter told us what the average slope was. And if that looked good we then landed on the spot and walked around and the pilots and a couple of us walked around and decided it looked good and so went back to the South Pole and sought volunteers to come with me. I had prepared by bringing tents and camping equipment and food and primus stoves and sleeping bags and things from McMurdo, so I had the equipment at the South Pole and I was just deluged with volunteers because they spend a year with their horizon consisting entirely of snow and I was flying around beautiful mountains. And so I put up a list on the wall for people to volunteer to come with me and it was about half the number of people at the South Pole station, numbering more than sixty at the time, signed the list, so I chose the prettiest girls I could find out of the volunteers and took them along. And so we spent a week at each of these two places doing the same as I’d done at Patriot Hills using a theodolite and a four-metre staff, just two of us, to survey something long enough for a big aircraft to land on. One of them was… had a strong crosswind which I knew all about and pilots don’t like, particularly American pilots, but the other one was just off the Upper Beardmore Glacier on a dead straight line between McMurdo and the South Pole, and this was ideal in that it was a smooth and small slope, one per cent slope, and well within limits
which I had got from the military of what military aircraft can do or are allowed to do. So I said well this is fine, why don’t you send in a Hercules. But there was a tremendous amount of resistance to having a Hercules fly anywhere except on skis, because they’d always regarded the Antarctic as a place for skis. And so it was only after I left and talking to the head of the whole National Science Foundation Antarctic operation that they did take a Hercules in and land on this ice and as I would have predicted, found no problem at all.

[0:14:26]

*Thank you. Given your impressions of South American science and its military character, essentially, how did you feel about working with the Chileans and the Chilean Air Force on the ice runway project to begin with?*

How did I feel? I would have worked with anybody who was willing to collaborate and I couldn’t see that I was doing anything against the interests of the Antarctic Treaty or my own country and I foresaw that we, the British, and other countries would see the tremendous advantage of flying direct to the Antarctic because you don’t need to charter a ship, you don’t need to have a base on the coast, you fly everything. So that economically it’s a very good way to do it unless you need to transport thousands of tons, in which case a ship comes in useful, or you’re setting up a permanent station on the coast. But just to do what we were doing, that is explore inland, you could do very well in many places.

[0:15:57]

And my first interest in this business was 1967 flying with the Super Constellation, the US Navy Super Constellation when I was working for BAS or Scott Polar, I forget which, because we were collaborating, and we were flying a wheeled aircraft up to several hours’ radius from McMurdo which was the only place where they had cleared a runway on sea ice to land wheeled aircraft. And I said to the pilot - we had many hours to say it, in fact almost a hundred hours with me and Gordon Robin sitting in the co-pilot’s seat – I said, ‘Well what would you do if you heard over the radio that McMurdo was socked in under cloud?’ And he said, ‘Well my instructions are to pancake on the Ross Ice Shelf’, which you can do even in a fog, you don’t need to see anything, there’s vast flat areas there, and you would not let your wheels down, you would pancake flat and slide along and as likely as not wreck the aircraft but shouldn’t hurt anybody. And I said, ‘Well, that’s a hell of a waste because I have seen in the Transantarctic Mountains with my earlier work in the sixties, I’ve seen lots of bare ice
areas and I can tell you exactly where to go in order to land on wheels, and although nobody is there and nobody has ever done it, there’s always a first time and then we would simply camp with our emergency gear and wait for somebody to come out with a Hercules full of fuel or whatever you needed’ and he said, ‘Well, I have my orders and that is to crash land on the Ross Ice Shelf’. Well, I thought that was stupid and I said so. I appreciate that in the military you’ve got to obey orders but that showed me the possibilities in the Transantarctic Mountains in particular, in the biggest mountain range, that there are plenty of places where you can land wheeled aircraft. So I was very aware long before retiring that this was, what shall we say, untapped resource. Bare ice landing areas.

[0:18:35]

Were you given any impression by the Chileans about precisely why they wanted to go further south, I mean the particular interest in, you know, sending forward those air force representatives to observe the landing and wanting feedback on your thoughts about airstrips and that kind of thing? What was your sense of precisely why they wanted…

Well, they were one of the claimant powers and one of the grounds for claiming sovereignty over any area of the earth’s surface is effective occupation. Well if you can’t get there because you’re too afraid to fly in there it’s not effective occupation. So that was their main interest in showing that they could do it, showing themselves that they could do it. And therefore it was sensible from their point of view to emulate what we were doing and at the time I was working with Adventure Network, no other government, no government was working with them, and so we were the obvious people to watch and see how we did it. I mean they were very naive. When we got… the very first season I went in with a Twin Otter paid for by mountaineers they came in with their two air force Twin Otters, very, very nervous about the whole business because they’d always landed at stations before and here they were landing in the middle of nowhere, and they pitched a tent, they had nice tents and they had sleeping bags, but they couldn’t imagine keeping warm at night in air temperatures of minus thirty or so, or minus forty - between thirty and forty – whereas to any experienced Antarctic field man it’s no problem, we were prepared. And so they had little 250 watt generator which they started about fifty yards from the tent, led wires in and had an electric bar heater inside their tent running all night to keep them from freezing, which caused a great
deal of laughter of course among the rest of us. We were too polite to laugh to their faces. But that is how... how they were unprepared and wanting to learn how we did it.

[0:21:40]

I was just imagining that you might have reservations about helping them to expand claims of sovereignty in that way?

No, I didn’t have any reservations like that because I couldn’t see what anybody would gain by military activities there, as long as you stuck to the Antarctic Treaty, which means you can’t take guns and things in and they were simply interested in expanding their ability to go anywhere, which I would have thought is a normal military requirement in any environment anywhere. You’ve got to have the ability to go where the government requires you to go, even if you can’t foresee any warlike reason for going there, but they liked to have the ability. In all the early years with the American operations, the richest country in the world, they used military aircraft and military personnel, which is permitted under the Antarctic Treaty if it’s to support science. Well, any military operation uses a vast number of people to do things and an absurd number by civilian standards, but at least it got the job done. And so there’s no other way that the Chileans could get scientists in the Antarctic except by the military as the Americans did. We have never used the military. We’ve recruited pilots from the Royal Air Force, but that’s all, because we didn’t need to because we’d got enough civilian people who are enthusiastic about working in the Antarctic.

[0:23:49]

Thank you. Could I ask you now to take yourself back to the late eighties and you’re writing a paper with Gordon Robin, Fifty Years of Progress and Understanding Ice Sheets, so you’re looking back over the previous fifty years. And I wonder if you could assess at that point the progress of studies of ice compared to progress in studies of oceans and of atmosphere. How did the progress in studying the ice on the surface of the earth compare to progress in studying oceans and atmosphere?

Any Antarctic organisation has to limit its interests, you can’t spread too thin. And you have to be good at what you do and at the time BAS therefore was doing very little on the oceans
but any ship going to unexplored waters will take echo soundings for charting purposes. But
BAS was not… it wasn’t doing no work at all but it was doing some work hitchhiking on the
ships that were taking supplies to the British stations, to the Antarctic. So it took
géophysicists, there was a section of BAS in the University of Birmingham which had people
doing seismic sounding from the ships, echo sounding from the ships, taking occasional
samples from the bottom. That was done but it was a pretty minor part of BAS activities.
[telephone ringing]

[break in recording]

I realise that, as you were explaining, the focus of BAS was on the study of ice and not of
oceans and atmosphere, but by asking the question I was wondering whether you could
assess the progress, for example, of BAS in studying ice compared to contemporary success
by other organisations, other scientific projects in studying oceans and atmosphere. So to
compare BAS’s work in coming to understand, the international community of glaciology, in
coming to understand ice compared to other people’s efforts to understand oceans and
atmosphere. So in other words, compared to international oceanography in studying the
ocean and meteorology in studying the atmosphere, how did the effort to understand ice
compare to the efforts of other people in other fields to come to understand the oceans and
atmosphere respectively?

Well, you’re wrong in suggesting that glaciology had priority except with glaciologists. BAS
had three scientific divisions: one was Earth Sciences which included glaciology, geology
and geophysics, one called Life Sciences which was botany and zoology and life in the
ocean, and then Atmospheric Sciences. And we were not far from equal in terms of numbers
of scientific staff and so I was just involved with one division, but from the time I was
appointed Head of Earth Sciences, I was supporting geology and geophysics as
enthusiastically as I was supporting glaciology.

[0:28:02]
You might expect BAS though to be focussing on the study of ice, given that it’s the British Antarctic Survey and I suppose the origin of the question is that in the article you, or you both speculate that the studies or attempts to model the dynamics of ice may well be more sophisticated than equivalent attempts to model the dynamics of the oceans and of the atmosphere so that at the time the understanding of the dynamic, or the modelling of the dynamics of ice might have been ahead, so that made me want you to assess more generally the relative success of understanding ice at the time compared to the other mediums.

Well the paper you’ve read was by two glaciologists: Robin and Swithinbank, so we were assessing what had happened in glaciology in the last twenty years and so the question you ask was not relevant to simply reporting on the glaciology, it didn’t involve comparisons with other sciences.

Okay. At the time, were there any efforts by glaciologists, geologists, geophysicists, geochemists, etc, studying ice, including the Antarctic, to join up with meteorologists and climatologists who were attempting to model global climate? In other words, were you speaking to meteorologists who were at the time attempting to produce models of the global climate and saying this is the contribution that understanding ice sheets can make to those models? I wonder whether there was any formal connection between those two kinds of science in order to improve the general global model or whether there were informal contacts? Perhaps there was no link at all, what happened?

Well we were living with the Atmospheric Sciences division and it was quite clear that ice sheets formed from snow, which comes from the atmosphere, so we were automatically close to them in discussions about ice sheets and really they couldn’t do without us because we told them how much snow had fallen in the past and therefore climate change, we were the ones who knew about climate change. They didn’t because we hadn’t been measuring climate in the Antarctic for very long. So we were naturally involved with them, but they were interested in instruments, measuring what’s happening in the atmosphere, both the lower atmosphere and upper atmosphere and we were strictly involved in things on the surface. But you need to put the two together in studying climate change.

[0:31:12]
I wondered whether there were any links between BAS and organisations like the Royal Meteorological Society or the Climatic Research Unit at UEA and that kind of thing, so that BAS science perhaps at the end of your period was feeding into attempts to model global climate form and…

That was after my time, but they certainly are involved now and since a lot of countries including BAS have got involved in deep drilling for palaeoclimatic study, this naturally links to climate change measured by anybody, including contemporary climate change. And so I don’t know if UEA had their unit at my time, but they took over largely from the Meteorological Office which was, and still is, part of the air force, because probably the people who finance the Meteorological Office said well, we’re much less interested in long term trends as we are in what’s happening now.

[0:32:35]

Okay. And I wonder were there any links in your period with places like the Institute of, National Institute of Oceanography which is now the Southampton University Institute?

Well, we were both under the same umbrella: Natural Environment Research Council, and they were interested in the observations that our ships could take en route to the Antarctic and sometimes contributed oceanographers to come, to hitchhike on the ships essentially, but our ships were not at the time able to divert from their main task of supplying the BAS stations, although they did everything possible to contribute to science where it could be done without reducing what they were there to do.

[0:33:41]

And at the time that you retired, around that time, sort of the mid eighties, what was your perception then of the advantages of ice over other mediums, over the atmosphere, over the oceans, the advantages of ice in establishing global climate change?

Well, it was an important way of knowing what had happenend in the past. Meteorology and climatology from measurements on the surface, we only had a very short time since 1944, the BAS stations, whereas climate is defined as roughly the average weather over at least thirty
year period. And the immediate realisation with ice drilling was that we could see what had happened in the past to any depth up to several glaciations in the past, and so the two are closely linked but we had the ability to go back into the past whereas the station meteorologists had the ability to examine what was happening during the BAS period: thirty, forty, fifty years.

So it’s as if, it’s almost as if the problem with the atmosphere is that it doesn’t keep a record of itself and the oceans don’t keep a record of themselves in the same way that ice keeps a record of itself…

Exactly, yes.

…because of its nature?

Yes.

Thank you.

[0:35:40]

Could I ask you now to, if possible, summarise your work with NASA from the sort of very earliest contact you had with that organisation to the most recent work?

Well NASA was involved in satellite images from the start and I realised very early on what satellite images could do for us. Initially it was helping the ships through pack ice, then it was looking at major weather patterns. And so I was interested in what NASA could do although NASA was working together with NOAA – National Oceanographic and Atmospheric Administration – the American government, in things which were more terrestrial in interest and so I was only very indirectly involved with NASA at that period but benefiting from techniques that they had developed. But it was eight years ago that I had an invitation to go there out of the blue [coughs] to discuss voyages to Mars, essentially, and when I said I have never been to Mars, they said well neither have we, so I said well, what can I contribute? They said well you have been on expeditions which lasted two and a half years where there was no possibility of being rescued and no outside help for a period of two
and a half years, whereas we, NASA, have only been to the moon which is very brief, up to a couple of weeks, and we cannot prepare for all the emergencies we might have. Indeed, the early moon shots if their return spacecraft had not operated they would all die, they accepted that. But going further afield is something quite new to them in terms of the duration and the absence from home, whereas for me it was something I’d done as a necessity. So they were interested in how we prepared. For example, when we first went to the Antarctic we took three years’ food, planning to stay there for two years, in case the ship couldn’t get back to us. We had to be prepared to do each other’s jobs if anybody got injured or killed and that came to pass on my first expedition, Norwegian-British-Swedish, we lost three lives out of fifteen and we all had to pitch in and do their jobs. And then they were interested in could we psychologically survive two and a half years, and I said well, as far as earth is concerned that’s nothing. To ordinary people though, that’s a long period to be isolated from friends and family and so I was able to say that it shouldn’t be any problem. Of course Mars is going to be a very different kettle of fish because no atmosphere that you can breathe and taking everything with you, but that’s the same as we did when we first went. And then how did we choose personnel. Well they choose their astronauts with very long years’ introduction [coughs], introduction and [coughs] using people who are used to taking lightning decisions when things go wrong, in other words, jet pilots. And those are the people they send to the moon. But going to Mars you’d be mad to do it without real serious scientific objectives, only part of which would be can you live on Mars, but the geology, the origin of the Mars landscape is potentially extremely interesting because of the indications of water flow at some time in the past. And so you need to send scientists. On the other hand, you’ve got a complex spacecraft which could go wrong and you need your jet pilot to react quickly when things go wrong. And you need a medic and again, on all the American Antarctic expeditions a doctor is a doctor and an ordinary physician and wouldn’t dream of touching dentistry or wounds to dogs, as we had, so our doctor had to be prepared for anything like that. And even mental upsets, you’ve got to be prepared for anything. And so they were interested in our experience and they were sort of surprised that with my experience I was so relaxed about it, I think because when I went down we accepted that you would do your best to survive but you might not and it was a risk worth running, and going to Mars will be the same sort of thing. You’ve got to have a doctor, yes, but actually I was at a dinner party with a lot of dentists last week and telling them about this and a dentist said well, teeth will continue to rot on Mars as they do anywhere else and it could be disabling and he said he would send a dentist, not a doctor. And I said well what about things like
appendix and he could say, oh we could cope with things like that, we’re trained as surgeons, not as advanced professional surgeons, but those things are much less likely than ordinary trauma wounds which anyone with medical training should be able to patch up, and teeth rotting away. And of course we had the example of our doctor taking out an eye and I said to the dentist, well what if you landed up having to take somebody’s eye out? He said well it wouldn’t be any more problem for me than it was for your doctor. This was an interesting… the first time I’d heard that thought and I will pass it on to NASA when I talk to them. But the possibility of things other than ordinary medical complaints are very real and you’ve got to anticipate it and you can’t afford to take a doctor and a dentist. They said how many people should we take, and we discussed two’s too little, three’s a crowd, but really you need more people. You’ve got to be able to fill in for anybody who’s injured or falls by the wayside. You’ve got to have your scientists, you’ve got to have your domestic considerations and your medic for emergencies. Although in discussing it with NASA I missed out the fact that they invited me over there to discuss it and we had a small conference including three people who’d been to the Antarctic in the era when you wintered and therefore had no recourse to outside help. Nowadays they winter but they do have recourse to outside help in an emergency. We didn’t. And so they were interested in our thoughts about that and were surprised that we were very relaxed about it, you’re running risks, you know you’re running risks, you accept the risks. And so I think although they had not been asked to decide that, only make recommendations, I think we homed in on a group of six for the first flight as being a combination of astronauts, geologists in particular and people who could take an interest in whatever life was found on Mars and then the fact that you look for water for survival and weather observations they would do, because there is weather on Mars, you have fogs on Mars, have sandstorms on Mars. But you could train somebody to do that without having a lifelong meteorologist.

[0:46:33]
And this was all reported and published in a report that I can show you and they knew that I remained interested and occasionally corresponded with the person who organised it in NASA, and then quite out of the blue last summer, they phoned up and said we want to have another talk concerned particularly with travelling on Mars, because all we’ve had on Mars are a couple of unmanned Rovers and they’re still there; one is bogged down in soft sand at the moment and the other one is carrying on moving very slowly because it’s solar powered and Mars is further away from the sun than we are so solar power is less, but it is working. And so the obvious development is manned exploration of Mars and this involves travelling.
How do you travel, bearing in mind that you have to carry or manufacture your oxygen, carry your food and fuel and solar power can power you anywhere, but only to move very slowly as their unmanned craft do at the moment. And then the Antarctic experience right back from Amundsen and Scott is that when you’re planning a long journey, as from the coast to the South Pole, you go out the season before, the summer before you’re intending to travel and you put out depots. And then when it comes to the next year you can travel faster with lighter loads and get done in that case getting to the South Pole and back alive much faster than you would if you tried to carry everything at once, which Scott didn’t, Shackleton didn’t, Amundsen didn’t, all put out depots. And so we said well, you put out depots. Well how do you do that? You have a manned Rover, and this is last August, I sat in the next version of a manned Rover, it’s pressurised, and two pilots or drivers and it has big tyres so it can cope with soft sand and you could take half a dozen people in it and enough supplies to last a few weeks. But they want to go further because the actual landing site, which they can select, has to be a compromise between climate – the poles are very cold – the possibility of finding water and life and finding a smooth enough area to land on. They’re still not confident of pinpoint landing like a jumpjet to go exactly where you want. They require large flat areas without or with fewer craters. As they are never ideally placed for all the things they want to look at, travel becomes essential. And so that again was normal for us to talk about putting out depots ahead of time, to them it was absolutely new, they’d never done it, although it was obvious you’d have to. And there are even other ways of doing it at great expense and that is the whole time you’re on the surface of Mars you’ll have an orbiting spacecraft above you and I said, well why can’t that make airdrops of your depots where you’re planning to go? And the answer is you can, but it’s very expensive because you’ve got to carry that load on the spacecraft, you’ve got to drop it and then you’ve got to have a way of stopping it from smashing on impact so that you have some kind of air drag device, parachute to slow it down and… But given all that, you can put down your depot exactly where you want to have it, well exactly, plus or minus perhaps a mile and again, the possibility that you might drop it into the middle of a deep crater and it would be difficult to get to, all these things have to be thought about. And so again, prior to this last conference they produced a report – both of these I can show you – and there’s going to be a report on the August meeting which we’ve contributed to, but has not yet been published.

Thank you. [end of track 20]
Could I ask you to summarise your work as lecturer on polar ships since retirement please?

Yes, I was immediately nabbed by Adventure Network, but then one cruise company heard that here was a man of wide experience in the Antarctic who was retired and so they came to me and said would I lecture on an Antarctic cruise, and I went and they were very pleased and they, same company said, well we’re going through the Northwest Passage next year, which is quite a difficult thing to do, would I come with them. And since that was a sort of adventure for me and involved going to one Russian port and Alaska and along the Canadian Arctic, some of which I knew, I said yes, because not only did it involve meeting interesting passengers - people were particularly interested because they’d paid through the nose to go on these trips, cost more than other trips in different parts of the world - and so you have interesting people and they want to hear what you have to say, but I was normally one of four lecturers. They tried to cover the ground by having one glaciologist or geologist, one marine biologist, one ornithologist – birds, including penguins – and the fourth is a historian, that is historian of exploration, which people are interested in. And so those four are the normal, all the time I’ve been with them, have been the normal minimum number of lecturers.

What is the company?

The first one I worked with was called Society Expeditions and that… changed its name… I’m struggling to think what it changed to. Anyway, they went out of business but the business was taken over by other people and then in more recent years I worked with a company called Quark – Q-U-A-R-K – which is the leading polar cruise ship company and have leased several ships including a Russian icebreaker. And so they go on the most difficult and most upmarket trips and price accordingly and they’ll even take you to the North Pole in a Russian nuclear powered icebreaker. I went, I took my wife. And that’s extremely expensive. At the time it was 20,000 dollars for ten days per person and it’s probably twice that now. But because it’s so exciting for people who’ve been stuck in an office all their lives there are people who pay.

And what decisions did you make about the content of lectures on various trips?
I was entirely free to do what I like and since I was the only person usually who had had extensive inland experience, I would talk about my experiences inland and I was the only one who could talk about those. I mean the biologists were all coastal because all the biology’s on the coast. And historian, anybody could do that if they’re sufficiently interested to do all the reading of historical accounts.

Was there a link then between material you were writing for lectures and material you were writing for your autobiographical books?

I wasn’t writing anything for lectures, I was lecturing, off the cuff.

Oh, okay.

From my own experience. I mean there are always tourists in the front row who are holding a microphone out, but I didn’t mind that, until one day somebody sent me recordings of all my lectures thinking I’d be interested and I’m not in the least interested in knowing what I’ve said, I know that I won’t get invited back if it’s not interesting.

But you didn’t have any notes or you didn’t look anything up beforehand?

No, always slideshows, they were always slideshows.

So you had to prepare the slides, that sort of structured the narrative?

Yeah, yeah. So I’d prepared eighty slides for a slideshow and that’s about the same as I would do now, although since it’s so easy and now they’re digital I’d probably put a hundred. I mean I’ve known people who do 300 and it’s just flashing through and really showing off what they’ve done and how good they are at photography, whereas I just want to cover the subject I’m talking about. So transparencies, for several years each lecture was eighty slides. But probably digitally now I’d put in a hundred, but a lot of people put in far more than that.
Thank you. Now I apologise in advance if this is going to cover some sort of unhappy memories, but could I ask you to – as it is a life story interview – to tell me about key changes in your personal life since retirement up to the present?

Well it’s eleven years since I lost my wife to breast cancer and suddenly plunged into… the children had all flown the nest by then except for our one handicapped boy who is in a group home, but there were just the two of us. And so it was a shock, but then I’d lived, even in this house, by myself before getting married and so you’re just thrown back into the same position that you’ve got to do everything for yourself. But then I do like to travel with people and so obviously the first person to take when I got on to these cruises was my wife, which I did, she came on several. And then when the opportunity presented itself I took one daughter on one cruise and then another daughter on the next cruise, so they were all understanding for the first time why I was interested in the Arctic or Antarctic and so they loved it, but they had their own lives to live and so the daughters had only done – well actually now the elder daughter, who’s dead now, she came on a part of an Arctic cruise with me later but started with the Antarctic cruise. And so I’ve been doing what any widower does, that is I have a circle of friends and I’ve chosen to take some on cruises at the cost of sacrificing what is called an honorarium, which is a hundred dollars a day they give to lecturers. Well I have to sacrifice that if I’m taking a guest and there has to be room on the ship because they’d much prefer somebody paying the full price, four or five hundred dollars a day. And so it’s a good deal for me, I mean I’ve got enough pension not to mind losing a hundred dollars a day for a couple of weeks and it has worked extremely well. I’ve been on one or two cruises [doorbell ringing] when I couldn’t find…

[break in recording]

[0:10:04]

Okay then. I wonder whether you could just go back and talk about personal and family life after retirement, but before your wife became ill, the sorts of things that you did in your – I realise that in your case retirement didn’t mean not working, but from the period of leaving BAS to…
From the period of leaving BAS I was concerned with what we call blue ice fields, initially with Adventure Network, then with the Americans, and that continued afterwards in terms of looking for other places where you could land wheeled aircraft in the Antarctic. Not in the Arctic, it’s much more difficult in the Arctic to find bare ice, but in the Antarctic there are large areas. So I continued that and published three or four papers with the US Army Cold Regions Research and Engineering Lab and that was a great privilege because they don’t, the US Army doesn’t like foreigners and it’s simply that I was the only person who could write and they were prepared to publish them and I don’t know if I – no, I probably didn’t include those because I’ve only got one copy, but I have got them. And so I wanted to limit myself to a month a year of cruise lecturing because for me it was a holiday and not a job. For people who didn’t have a good pension it’s a job, in other words, a hundred dollars a day clear and everything else is provided is a good deal for a young person who enjoys that sort of adventure.

[0:12:17]

Did you have more free time after retirement from BAS than you had before, or was it just a different kind of work taking up as much time?

Different kind of work taking up as much time and [coughs] I didn’t start writing books because I was having such fun lecturing on cruise ships and I think I did about ten years’ lecturing on cruise ships after I retired in 1986 before I thought well, it’d be nice to publish my experiences because they’re a bit unusual and I started writing and chose to start with the American one and found it hard to find a publisher but eventually found [coughs] a very good publisher who was happy to do it and produced lots of, reproduced my colour pictures. And that encouraged me, but that was only about working with the Americans so I had a lot more to write about. And the second book I published, published in England. Again, it was hard to find a publisher but I did and that was Forty Years on Ice, and that sold quite well and is still in print and that I wrote entirely in my office in my spare room here, I wrote all my books in that room, initially on a typewriter. I very quickly got disillusioned, well, I belong to the Writers’ Guild or whatever it’s called, whose journal was very good in saying to people, writing longhand is just prehistoric, you must write on a keyboard, and then as soon as you could have your writing come up in front of you on a screen you must do that because then you are looking at clean copy all the time because as soon as you see something’s wrong
you correct it and you’re looking at clean copy. And then when you eventually send a
manuscript to a publisher it’s all clean without a single hand alteration, because it’s your
latest version, which is more likely to impress a publisher than scribbles. And so I wrote all
my books here, but having had a heart attack, which is now twenty-eight years ago, while I
was still working in BAS, ever since then I’ve been expecting to drop dead every day, not
worrying particularly about it but expecting that you are certainly weakened by a heart
attack. And so I wrote one book at a time, firstly because I would find it very difficult to find
a publisher who would take on an unknown who produced a thick autobiography - I began
here and my parents were this - most unlikely to find a publisher. So I bit off these little bits,
but between each book I was expecting I might well die and I don’t worry about it, but I
might still die tomorrow. That doesn’t worry me in the least because I’ve had such a decent
life span, and that’s why I wrote them in parts. But after publishing *Forty Years on Ice*, one
of the reviewers said this is absurd, this book doesn’t include the most interesting parts of his
lifetime, which is the Norwegian-British-Swedish Expedition and the Soviet Antarctic
Expedition. Well, I’d explained to him that I was going to get around to those but he really
chewed me in a review which he had something he wanted to say, although I’d told him. But
he was thinking that an autobiography is this, something thick and is one, whereas because I
expected I might die I did it in bits and I was very pleased each time to live to see the book
appear in print. And you must remind me to show you the reviews, which I’m happy to do.
So that’s how it came about and I had more time and I didn’t… I was able to look after my
wife while she was going downhill and then I am rattling about in this house and carried on
with autobiography and third volume and fourth volume and then the little bit I wrote for the
family about my wartime experiences, which I showed you. And so that’s how the books
came about and they certainly have been well received. But I am writing for people who are
interested in expeditions and adventures and what I wrote in the first, the preface to the first
book is that this is not about science but about adventures in the pursuit of science, and all
four of them have been essentially the same. I put in minimum science to explain why we
were there, we weren’t there just to have an adventure, and then described the adventures and
what they all involved, but always quoting the published results to show that it was not just
an adventure, all had a purpose.

[0:19:30]
Could I just go back and pick up on some of the things that you’ve said in that very useful summary? I wonder whether you could start with – not a great memory I realise – but when was the heart attack while you were at BAS, what year was it?

It was probably 1985, it was before I retired.

So in the year you retired. Was that partly why you retired or just coincidence?

No. I mean I was retired at sixty, which was automatic.

And what was the medical advice at the time, post-heart attack about, you know, the sorts of things you ought to be doing or not doing, that sort of thing?

Luckily I was [coughs] investigated in Papworth Hospital because they couldn’t see - initially the signs were that it was not a coronary – in Papworth Hospital to see whether there were any blockages in my arteries or veins, which is the normal cause of heart attacks. And they injected this sort of black ink through my arm through a pipe up into my heart and then once they put the black ink in they X-rayed me I think something like 400 frames a minute to see the rate of spread of this black blood through all the blood vessels. Well they know what’s normal for unblocked blood vessels and they would immediately identify slow flow through a blocked one. Well, they discovered there were no blocks at all, I was absolutely clear, which astonished them and astonished me. So it turned out that my problem is an electrical short circuit, that the signal for the next heartbeat sometimes goes through before it’s supposed to and so you get tachycardia, that is much faster heart rate. And I survived a number of attacks until they found a drug that prevented this happening, but it didn’t prevent anything else. And I said well, ‘What can I and can’t do?’ and the cardiologist said, ‘You can do whatever you feel like’. Well, that’s carte blanche, which is what I’ve been doing ever since and so I do, I don’t limit my exertion, I go to the gym twice a week and have a hard workout with that advice, that do whatever I feel like doing. And so I’ve been extremely lucky that it’s now something like twenty-eight years since that happened and I’ve... oh it happened just after my first... no, it happened not long before I retired and when the Americans wanted me to go to the Antarctic I managed to get the medics to make it sound not alarming and that’s why I was allowed to, but then shortly after coming back from the... from... yes, the season in 1988/89 with the Americans, I had an episode of tachycardia.
and was carted off to hospital, but I recovered after a few days, but that came out in my medical history and they wouldn’t take me again. They wanted me to come again, but they wouldn’t take me. But as far as Adventure Network goes, all they’re concerned about is that I’m insured against emergency evacuation and they clearly don’t mind if I drop dead or anything as long as it doesn’t cost them anything. So I’ve simply taken out a worldwide travel insurance, which you pay more for, and have been living on that ever since and they’ve been happy to take me on several occasions. But I’m on a daily pill which stops tachycardia, so that it is years since I had any problem, but last time I had a problem it was bad, four years ago, in that I was carted off in an ambulance and they said that my heart had stopped. I don’t believe it because I think you die when your heart stops, but it was probably beating 200 beats a minute, which is very, very weak and it even happened when I was on one of my cruises and my girlfriend, I said, ‘Put your ear to my chest and tell me how fast my heart is beating’ and she put her ear to my chest and said, ‘I can’t detect any heartbeat at all’. And I said, ‘Well that’s funny because I’m talking to you’. [laughs] And the thing is that when it’s 200 beats a minute it is getting some blood through, not as much as normal, but getting some through. And so by trial and error we got down to the right size of pill but then the cardiologist said that as you get older you probably need less of the drug to stop you having tachycardia and you can halve your dose to 100 milligrams a day instead of 200 milligrams. Well, that is what caused the last upset and being carted off, apparently dead, in ambulance and it was then that the cardiologist I think had a slightly guilty conscience about having suggested halving the dose of the drug and to make up for that – of course he never admitted anything like that – he said well I can arrange for you to have a pacemaker put in which would do what the hospital does, which is give you electric shock to bring you back round, and this is internal in your chest, here, and it’s automatic and when it detects a fast heart rate it gives you an electric shock which either kills you or cures you immediately. And in the four years since it was installed I haven’t had any trouble and I think it’s because I’m now on the dose that I’m not going to reduce and it was a mistake to reduce the dose, so I’m now on 200 milligrams a day and that’s the way it’s going to stay regardless of what anybody advises about whether I’d get away with reducing it, I know that I probably won’t.

So you’ve got two lines of defence; the pacemaker and the drugs?

Yes.
Yeah, so the drug stops the pacemaker being brought into action, but if something goes wrong the pacemaker deals with it. So you… BAS would not take me to the Antarctic now. Actually they’ve now, typical government, they’ve made a rule that nobody over sixty is allowed to be taken on BAS because they think you’re a liability, like Americans live with liability worries. Whereas Adventure Network know that they couldn’t be blamed for me having tachycardia but they would out of humanity be required to evacuate me immediately to the nearest hospital, which could cost upwards of £100,000 to get a special flight in. Well, I’m covered for that with my insurance, doesn’t worry me.

[0:29:23]

Is there a link then between having the heart attacks and the heart condition and working for Adventure Network because of their willingness to take you when government options were closing down because of it?

No, government options closed down because of retirement, automatic retirement at age sixty. But in the early years of Adventure Network they were taking mountaineers who were accepting big risks and crashing on the way was just one of them. And it was before they had to prepare themselves for being sued by anybody for a plane crashing or anything. But that didn’t take very long when you start taking Americans. Any conceivable excuse they can find to sue you, they will. So they now have a very stiff contract that any paying participant signs saying they’re not responsible, but of course they’re morally responsible for getting you to hospital as soon as you can, so they’ve got to have insurance to pay for the extra flight, and I haven’t asked my insurance, but it’s worldwide and has a limit of I think two million dollars or something for an emergency evacuation.

[0:31:12]

Was the heart thing the most significant illness since the childhood one that you’ve told me about when you were… when you were carried, was it the most…

No, I said to the cardiologist that I was reported to have had rheumatic fever when I was young, as a child, and I remember the symptoms; I used to freeze up in this position. No pain, but I couldn’t bend the legs. And he said in view of my subsequent history since the
tachycardia problem that he didn’t think that was anything to do with it and probably what I had was not rheumatic fever, but there’s an interesting story attached to that, and that is that in my medical for the Norwegian-British-Swedish Expedition I didn’t tell them that, which you could say is dishonest but I knew that it would rule me out. So it was a very cursory sort of medical in those days, in fact it was nothing, I think a chap listened to my heart with a stethoscope and it was old boy network in Cambridge and so the Scott Polar was not charged for it and there were two questions that I answered with a lie and I’ve never regretted it. The Director of the Scott Polar at the time was Launcelot Fleming who was a Chaplain at Trinity Hall and promoted from there to be Bishop of Norwich and then Bishop of Portsmouth and then Chaplain to the Queen, so we remained friends for life. He’d taken me out rowing in a pair-oared boat on the Cam, obviously thinking that on a polar expedition you’ve got to do your share of the dirty work, hard work, and with a pair-oared boat if you don’t pull hard enough you go into the bank, that was always what I guessed, and also to see whether I was fit. And he said, ‘You’ve got good circulation haven’t you?’ and I said, ‘Yes, yes, yes’. Well I’ve noticed that I’ve always worn more clothes than other people in the Antarctic, doesn’t stop me doing any work, but I think it’s probably poor circulation. And then, yeah, in the medical exam, retired air force doctor who made a very cursory examination and when he discovered that I had been in first class rowing he sort of thought, well there’s no more worries if he can cope with first class rowing. He said, ‘Have you any skeletons in the cupboard?’ Well I had this reported to have had rheumatic fever, and I said no. So my whole career’s based on two lies.

[0:34:48]

[laughs] Thank you. Did the heart condition significantly alter – perhaps I should ask it this way – in what way did the heart condition alter your sense of yourself or of life and that sort of thing?

Interesting question. You live with it because you have no choice, and I would think anybody who has a heart attack, and perhaps I wanted to live life to the full knowing that it might end tomorrow and that’s perhaps why easily accepted invitations to go lecturing and invitations to go looking for blue ice fields in the Antarctic. That may have been behind it but I’ve always been an active person so I can’t see any other way in which it affected, but
with the books, as I said, I wrote one at a time with the thought at the back of my mind that I want to have them published before I die.

*When did you start the first book? It was published in 1997.*

I would think it took two years because I was going lecturing at the same time, so I only did it when I was at home.

*So let’s say you started that in 1999 – er, 1995.*

Yeah.

[0:36:35]

*Why did you, can you remember the decision to start to write anything at all?*

That I had always… I knew that I’d had unusual life and a lot of adventures that some people might like to read about, but I was too busy lecturing on cruise ships and enjoying that, Arctic and Antarctic, probably more than the month I said I aimed for. I mean the Northwest Passage alone was a couple of months. And so was, yeah, yes, all through that period since retiring I’ve been working with the US Geological Survey on the coastal mapping of the Antarctic – I think I showed you one of the sheets – and that’s still going on. I had a four-year contract with them but they have been very, very slow. I’ve always been pretty good, but by the time the four-year contract came to an end they had not fed me enough work to do and so they wanted me to go on working with them but it was a great palaver to organise a new contract so they had me dishonestly sign a form to say that I’d done all the work contracted. They knew I hadn’t, I knew I hadn’t, but they also knew that I was a gentleman and would keep on working for them without more money, which I have done up to now. And so that’s how that came about and they’re doing a lot of hard work now. All I did was the initial interpretation of the whole coastline from satellite images, which I mean was a very major work because I had to use the published maps to control the maps that I was drawing. And then they have fair drawn the maps, but because they’ve been so slow, better satellite pictures have come out in the course of time and I was not prepared to go on open-ended, forever, but very interested and so they’ve had other people do the subsequent
coastlines, which are different because ice shelves move back and forth, they’ve, US Geological Survey has employed people locally to do it seeking collaboration with anybody they can find who is interested. They’ve worked with the Australians who had done some of their own work and later with BAS. I tried to get BAS involved but at the time I tried they were not and it was only when they saw the quality of the work that was coming out of Geological Survey they decided well, it would be rather nice to have them in the Antarctic Peninsula. I mean the Americans had decided to include the Antarctic Peninsula but were always willing to collaborate with anybody who would collaborate and it was not until we started publishing the American ones that they realised this was a serious project and it was a good worthwhile project anywhere in the Antarctic and since BAS was involved in the Antarctic Peninsula they could be useful in this. And so they are now fully collaborating, but only in the Antarctic Peninsula because that’s where BAS does most of its work.

[0:41:13]

So just to be clear, why was then a good time to start your first book? Was there…

I think I probably postponed it for some time after it became possible to find time for doing it because I kept on an involvement with Adventure Network all the time, I mean it was only two and a half years ago that I last went with them, so that’s more than twenty years after retiring, and that was taking time and writing reports for them and generally I’ve always had people consulting me who want to go to the Antarctic because if you go to BAS and say I’m going on a private expedition to the Antarctic, they will effectively say go away, we’re a scientific organisation, if you’re not going to do science we haven’t got time to talk to you. So then they look around for somebody who has experience who is prepared to talk to them and so they home in on me and it’s happened, I mean there’s a lot of these books have been written by Antarctic adventurers, they give me copies after the adventure because I have advised them, and not needing to be paid, well knowing that they might baulk at paying for something because they don’t know what they’re paying for. They’re paying for experience, but they don’t know that that is… they don’t always know that’s relevant to what they’ll do, they come to me because they’ve been advised that I am prepared to talk to them and give them my experience and not send them a bill afterwards. And this is still going on, I mean it’s only a few months since I had the last one. Adventure Network tend to refer enquiries about particular expeditions which require good maps, refer them to me and since I know
more about maps than anybody in Adventure Network I can always find the best maps and since I’ve done a lot of travelling I can advise on travelling, so that still goes on and it’s very nice because they all give me their books when they write them.

[0:44:19]

So people like Ranulph Fiennes, who I can see has got several books on the shelf, and other private adventurers ask you before going to places for advice on logistics and the use of maps for navigation and that sort of…

Yes, and since I’d done all the interpreting of satellite images so I am pretty skilled at knowing from a satellite image where you can travel or where you can’t, where it’s too dangerous to travel.

So you’ve plotted actual journeys for…

Yes, I have. Yeah. And as I say, that still goes on. I’m always very careful to say that crevasses can occur anywhere and you’ve got to keep your eyes open wherever you go and there’s no area that can be declared totally crevasse free. You learn where to expect the possibility of crevasses and where you don’t expect them. And so they’re always very grateful for that guidance but not bound to follow it. I mean for saving my own skin I developed this means of driving snowmobiles from behind with long ropes sixty feet behind, but some BAS people, in fact most of them thought that was ridiculous, perhaps because they were not so steady on skis and they’ve lost two lives so far through sitting on a vehicle when it’s gone into a crevasse, which they could have avoided by taking the trouble, as they would see it, to drive from behind. And so in dangerous areas I advise people how best to avoid crevasse risk. You never can avert it continuously. But I mean it surprises me that at age eighty-three I’m still consulted by very fit young men in their twenties about going to the Antarctic and surprising even more that I’m asked about travelling on Mars.

Mm. [laughs]

[0:47:07]
Were you aiming for a particular audience with your books, a particular readership and did that affect the publisher that you were seeking?

I was obviously aiming at people interested in travel, particularly expedition travel, but I didn’t think about it, it was simply that what I knew about and what I had to say and publishers who turned me down said that it all sounds, what you’ve done all sounds too mundane and you’ve not, as you would see it, exaggerated the risks and an adventurer wants to convince you that he’s had an adventure, that is to say, tell you about all the risk. Well I’ve had adventures and I will tell you about all the risks, but I don’t boast about them. I think I just learnt to live with them. And so I was unconsciously writing for my kind I think, people who wanted to go on polar expeditions.

You’re saying that other publishers turned down the manuscript because they thought that you weren’t sensationalising the risk enough?

Yeah.

And is that the sort of thing they’d write in the letter back to you is it?

Yeah, they wrote that you haven’t dramatised this. Well, I’m not prepared to exaggerate the adventures because I’ve had quite a few adventures that to my mind don’t need exaggerating, but if you’re selling a book because, as an adventure story, probably would sell better if you, the more adventures you have. And so the adventurers do write adventures and have no, don’t have an aversion to having adventures. I mean I, my adventures have been consistent with doing everything possible to avoid getting killed, because I don’t want to get killed. Some of the people who read about our low flying in the Antarctic say well, that doesn’t sound like, consistent with safety and I convinced them that we thought very hard, long and hard about doing it before we did it and never had any regrets because we never hit the ground and if we had hit the ground we would have bounced off, because we were on skis.

So would you, in what ways would you regard your books as different then from some of the titles I can see behind you that you refer to as being the adventurous books, like Living Dangerously, Beyond Endurance, how would your books compare to those?
That I always started by saying what scientific purpose a particular operation or journey was to serve and then since it was working in difficult areas, how we did it. And then what came out of it in the way of scientific results. So my books have all got a list of references of the published works. I think that’s the difference and they’ve got an index. All my books have an index, whereas quite a lot of adventurers, they just want to tell you what adventures they’ve had and they’re not really interested in having it as a historical record, it’s to earn money to go on other expeditions, probably. People have different motives but most adventurers, I mean people I would call adventurers, write in order that they are known as adventurers, are capable of doing this sort of thing.

[0:51:46]

Whereas you wrote for?

Well, posterity would be a tendentious word, but I thought the work that we’d done, the fieldwork, was worth adding to history because we’d done things which nobody else had done in ways that nobody else had done and I thought history is not history until somebody’s written it.

Do you, what do you think that your books have in common, and if you could also address what you think your books, how your books differ from the classic historical accounts of Antarctic travel then. I’m thinking of Scott and Shackleton and that kind of account.

They’re very similar. Because I’d read Scott and Shackleton and they were describing what it was like to do the work, they’d made clear at the beginning what the purpose was, they had their adventures and they always wrote about the results. So all classic accounts of expeditions I was in many ways unconsciously emulating them and indeed, in travelling to areas where they had travelled, in the Transantarctic Mountains for instance on the Beardmore Glacier, it would have been absurdly remiss not to have read their accounts to find out anything I could about the area I was going to. So I always read the history of any area I was going to and that helped a great deal in knowing what to expect.

Thank you.
And people reading my work are helped in the same way.

[0:53:53]

_In that way then we can see the autobiographical writing as a particular kind of archive and of your life and work, can we talk about another, other forms of archiving? So I wondered whether you could summarise where you decided to put different kinds of records that you’ve created throughout your life and work? You’ve got photographic, you’ve got videos, you’ve got diaries, you’ve got unpublished accounts, you’ve got published accounts, you’ve got your own polar library. If you could please talk for the recording about where you plan to put these things as an archive?

Yes. All my unpublished material I’ve left to the Scott Polar Institute in my will and that includes photographs, diaries, field notes, files, everything, for them to sort it out and decide what they want to keep when I’m gone. BAS, having so many people in its history of a big organisation doesn’t have archiving as one of its principal functions as Scott Polar does and so BAS has not sought records from me. Certainly they’ve got my books in their library and people read them, but they would like my field diaries, but since half my field diaries are not about working with BAS I had to think of where they would all go together and the Scott Polar exists to preserve historical records for the benefit of anybody who wants to use them. BAS is very good at preserving records of BAS work. The Scott Polar records anybody’s work on the grounds that you never know, if you’re preparing to go, you never know whose work was relevant until you read it. And photographs, I gave them duplicate transparencies and I gave the Royal Geographical Society duplicate transparencies. They came here, spent several days going through my transparencies and said they wanted a copy of this lot. So they’ve got them and they’ve got non-exclusive reproduction rights that I’ve given them. And BAS makes you sign a contract saying that all your photographs belong, the copyright belongs to BAS, but they’ve never enforced it in terms of preventing you publishing and collecting fees from the publisher, which they could do. We all signed a contract saying that all our material, whether or not we used our own camera, belongs to the government, but they realise that would be rather cold-blooded because it’s personal experience, people’s lives that they wanted to record. But since I’ve started scanning my photographs I’ve given BAS more than a thousand scans without being asked, just for their archives. But I’ve given the same ones to the Scott Polar and I’m about to offer them to the Royal Geographical
Society. Royal Geographical Society has several hundred transparencies but since those are going out of fashion now, but the original transparencies, I mean I’ve only scanned probably fifteen per cent of my transparencies, I’ve scanned the best ones and those are the ones I’ve distributed. But the transparencies themselves will go to Scott Polar archives and if they’ve got any sense they’ll throw out the duplicates made from the originals and keep the originals, which they can scan at any time. And since I’ve started scanning people have seen a transparency in the Scott Polar and said I want to reproduce that but your scan is not high enough resolution, will you please scan it at high resolution, which I do, and which when I’m gone they can do from the original transparency if it hasn’t faded. So the really heroic era negatives that they have been scanning, they scan at a very high resolution with very fast equipment, something like forty megabytes in TIF format and store the lot, whereas I do JPEG which is a compression. But I have even, even lately, last week I had people asking for high resolution and so I scan on my slide scanner at sixty-five megabytes and the file comes out at something like sixty megabytes. Well if you don’t want to do high resolution publishing, you want that reduced, it’s too big a file. But I find that if I’ve scanned something on TIF at sixty-five megabytes and I then convert that to JPEG, it comes down to about five megabytes which is, for JPEG, is a high resolution because most people publish from less than that. So I distribute everything as widely as possible, but the Scott Polar has, it’s my choice of the ultimate destination of anything they want, except the published books which they’ve all got.

So what will you do with your polar library?

To my daughter who’ll probably sell it, and I see nothing against that, it’s part of my legacy, the Scott Polar bit, it’s everything. So I’ve sold a few valuable books already to Christie’s auctions and if the Scott Polar expressed a particular interest in any of my books I would certainly say they can have them, but I don’t want to just… well, when they get duplicates they feel free to sell them off for the benefit of the Institute. Well I have instead left them a legacy in cash when I die rather than leaving them the trouble of selling the books, and so my daughter will sell them because she, not being rich, she’s going to get what I have but it’s not an awful lot.

[1:02:23]
And could you tell me about the work you’re doing with the – or were doing recently – with the small handheld digital recorder and your photo albums? I think it’s someone in American is asking you to do a narration. Could you say who that is, where they are and what it’s all about?

Yes, it’s Antarctic Society which began as a, and still is, an old boys’ club, but in thinking, because the average age is rather old, of posterity, realised that we should be leaving for future generations something that they can hang on to. And they have a very clever IT man who’s worked in the Antarctic and therefore sees the value of historical records, particularly since the IGY, because that’s when the main American work has been done, I mean apart from Byrd expeditions, and has actively gone out to get records before people die, which is a very good idea because there are a lot of interesting experiences and I’ve just solicited an unpublished book manuscript from an American that I thought should have been published half a century ago but wasn’t, he couldn’t find a publisher, he probably didn’t try as hard as I’d do to get it published, because people go on to other jobs. And I’m the first person to have shown an interest in this manuscript and so I said I want it for the Scott Polar archives, which is where it will go, and this is during the last few months I’ve got hold of that. Well nobody’s shown any interest in it otherwise, but that’ll go to the Scott Polar, carefully catalogued in reference to the expedition he was on. So things like that I have encouraged people to write. But the Antarctic Society has now got serious and they are archiving things that nobody else is archiving, photographs. And so they’ve had more than 1700 of mine that I’ve scanned and captioned. But they came back and said well, these are very interesting but your caption doesn’t explain the circumstances of taking these interesting pictures. Would you spout into a recorder the stories behind the pictures and for each one that you think is interesting, to other people that is. And they sent me a voice recorder, smaller version of that, and I’ve got it and I’ve selected the interesting ones out of the 1700 that they’ve got. I mean many, they’re just a landscape and it needs a place name, which they’ve got. But in exotic places and exotic activities they want to know how on earth I came to be doing this or going there, and this has been great fun and I finished it and they are tying it, these narrations, to the photographs so that people will be able to select a photograph and get my little voice spiel on that particular photograph and I think this is a great contribution to history.

Where are they going to be held? The photographs and the recordings?
They’ll be available to anybody because they’re all digital and at the moment they’re just held by two people who are involved with the compilation, but anybody will be able to get hold of the material.

[1:07:24]

*I think that the British Library might be interested in perhaps having a link on our website to that project so I don’t know… so it’s the Antarctic Society. Is it based in a university and who are the individuals involved?*

It’s not a university, it’s a private club that anybody interested in the Antarctic can join. So it began as simply an old boys’ club and they had lecture meetings in Washington DC and other places. I lectured them, a long time ago, I suppose forty years ago, in Washington and they’ve realised that we’ve got a lot of interesting things which should be preserved when we die and naturally we are dying one by one, the older generation, and that now photographs can be permanently preserved in digital format and easily distributed to anybody who wants them, they are doing this, and I will give you the reference, but it’s a noble service to Antarctic history really.

[1:09:02]

*Thank you. Could I ask you about diary writing and obviously the diaries that you wrote sort of constantly on fieldwork were very useful for future writing, but could I ask you what was the value of them at the time; personally, psychologically or scientifically, or all three, what was the value or role of writing at the time, rather than projected forward?*

To remember dates and times and sequence for what we did and what I thought of it at the time, but I was consciously emulating the heroic age who were very good about writing every day about what they did on the grounds that it is interesting to people who come afterwards. And so I was writing very straightforward what we did and not a great deal about my thoughts because I’m far more a man of action than of thoughts, the thoughts come afterwards when I was writing my books of course, but they are hung on the peg of date and time and where we were: date and time and place.
Did you write diaries when you weren’t on fieldwork or expeditions, when you were just going to the office and coming home in the evening?

No I never did, I feel as the vast majority of humans feel, that I should have and it would have been of interest to me and my family at least to do it, and I never have, no. So I keep all my old engagement books, so when it comes to needing a particular date that I did something or went somewhere I can look it up. I’m going to Australia in June for fun and applied to the Australians for a visa and they came back and said you’ve been in Australia since 2006 or ’07. And I said no I haven’t, I’ve been here all the time. And they said well we’ve got you recorded as coming in to Sydney on a certain date and never going out, could you please tell us where you went out and how? Well, I went out from Hobart and it was stamped in my passport, so it was in my passport, but whoever stamped it in the passport didn’t keep a record otherwise. So I was able to demonstrate that I was not still in Australia and they were very relieved at that and so they have that record that I’ve been there. But I’ve now got my visa for going in June.

[1:02:38]

Now we’ve reached the end of the process, I wondered whether you could say how you’ve felt about being recorded for National Life Stories, the process of talking about your life?

Well I’m very pleased really, because I think I have things which are worth recording, as I did in my books and until you came along I thought my books were all that’s needed, but probably I’ve confided to you thoughts, things which are not in the books and for somebody who is really enthusiastic - and to listen to fifteen hours of recording you have to be really enthusiastic – it provides more information on the background to my work, things that I had not put in the books and why I did these things. So I’m quite sure it’s valuable for people who will take a special interest for one reason or another.

Thank you very much.

[end of track 21 – end of recording]