

NELSON NORMAN

Edited transcript of a recording of Nelson Norman interviewed by Chris Eldon Lee on 24th September 2012. BAS Archives AD6/24/1/187. Transcribed by Andy Smith, 10th December 2013.

[Part 1 0:00:00] Lee: This is Nelson Norman, interviewed by Chris Eldon Lee on the 24th of September 2013¹. Nelson Norman, Part One.

Norman: John Nelson Norman, born in 16th of May 1932 in Lochfield Crescent, Paisley.

[Part 1 0:00:21] Lee: Would you say your father was an educated man?

Norman: Yes, he was.

[Part 1 0:00:26] Lee: In what way?

Norman: My father was a Customs and Excise officer, and he had been in the First World War, at the Battle of the Somme, with a view to becoming a schoolmaster. He had received his education in Paisley Grammar School, but went to war instead and when he came back of course it was a bit late. So he sat the Civil Service exam and entered the Customs Service.

[Part 1 0:01:01] Lee: And did you have a private education, or ordinary state school.

Norman: It was Paisley Grammar School, which was a private school really, yes.

[Part 1 0:01:12] Lee: Were you destined to go into medicine, do you think?

Norman: Well yes, I was destined to go into medicine in that I had a very bad appendicitis when I was 12 years of age, without thinking about the future. Really I don't know, there was something about the way I was managed by the surgeon of the day, that I admired so much. It was a sort of hero worship. So 'I would like to do that sort of business.' Also in these days a burst appendix was rather a big problem and two of my classmates had had a burst appendix and had died in the local infirmary. It was the pre- antibiotic era you see, and when I got it, they didn't have any beds so I was sent to a Glasgow hospital, the Victoria Infirmary, and came under the influence of this man Robert Mailer. I survived, just, and that was what made me want to be a doctor, so that when I was asked 'Why did you decide to become a doctor?' as they do in interviews, I never quite knew what to say because it was a bit embarrassing. And I think a lot of doctors are a bit like that. They have got this idea and they don't quite like to say why.

[Part 1 0:02:49] Lee: So would you then have, at the age of 12 or 13, started to gather the experience you needed to become a doctor?

¹ Actually 24th September 2012.

Norman: Well I was a bit lackadaisical at school; I mean I wouldn't have said I was a high flyer at school until that time. I recognised then that it was necessary to have academic qualifications to get into a medical school. Because at that time, of course we were at the end of the war – and a lot of ex-servicemen getting into university – and you really needed to have a lot of reasonable academic qualifications to get in. So I started to work very hard at school and got my grades up; so I was working at it right from that time.

[Part 1 0:03:39] Lee: Were your parents pleased at your career choice?

Norman: Yes, yes, I think they were. My mother always was fascinated with the concept of medical research. She had suggested this to me before I got appendicitis. I said 'No, that does not appeal to me at all.' but it did subsequently.

[Part 1 0:04:00] Lee: Which university did you go to?

Norman: Glasgow.

[Part 1 0:04:04] Lee: To study any particular branch of medicine or ...?

Norman: Well it was just straight medicine in these days. Everybody around there went to Glasgow University. I never thought of any other university at the time. Since my family was not medical and there was no advice given where I should go or what I should do. That made me work quite hard there because I think there were quite a few people in my year whose fathers were doctors, and they didn't do all that well, because I think they thought 'If the old man can do it, it can't be all that difficult.' Whereas I didn't have any medical predecessors and so I thought it might be quite difficult and worked a bit harder.

[Part 1 0:04:56] Lee: Did you actually work as a doctor? Did you practise before your Antarctic trips?

Norman: No, well yes. I qualified and then a year in hospital, as we did in these days. Then it was National Service time and so I was taken into the RAMC where I didn't really practise medicine there but I was asked where I would like to go. This was the end of National Service and they said 'We can accommodate you.' Half of the year was already engaged and about to be married, so they wanted to have home postings and I wasn't in any way involved, so I said 'I want to travel. I want to go the Far East, Germany, any place as long as I go and travel a bit.' So they sent me to Northern Ireland [laughs] and I wasn't very pleased. And what actually happened next was that Bill Sloman, who was running the Antarctic Survey at the time, suddenly had to recruit a bunch of people to go to Halley to take it over from the Royal Society, and he came to our recruiting bit and there described BAS and so forth and so on.

[Part 1 0:06:24] Norman: I put my hand up. I said to somebody, my colleague, 'Falkland Islands Dependencies? Where's the Falkland Islands again? Are they not off South America?' 'Yes,' he said, 'it's South America. A job you just get in a boat and you go round bits of South America and look after people.' I said 'I have always wanted to go to South America. That would be nice.' 'Yes,' I said 'I will do it.' And then I heard nothing more and was then sent to Northern Ireland where I was put in

charge of the neurology for the Army, Navy and Air Force, which was a subject I knew absolutely nothing about. Anyway then I was in a military hospital where the CO was obsessive about snooker and required everyone to play snooker with him. I told him 'I can't play; I have never played snooker.' Oh he insisted, it was dead easy, and so I was taken along to the snooker board where I slipped and drew a hole in his baize thing.

[Part 1 0:07:32] Norman: So I was immediately fired from the hospital and sent to a regiment – the Royal Warwicks hospital – which I rather enjoyed. But one of the problems was that during the induction course into the military, I had had to return to a court in Glasgow, about a case that I had to give evidence about somebody I had treated in the casualty department. So I missed half of the instruction about what you do, and I found it really a bit difficult coping in a regiment which was very military: when you saluted and when you didn't salute. I think I passed round the parade ground one morning on the way to the sick bay and they all started to stamp their feet and saluted and I didn't quite know how to respond.

[Part 1 0:08:25] Lee: So what happened about going to the Antarctic? Did you apply or were you transferred or ...?

Norman: No, what happened was that this regiment was going to Aden and so they said 'You will have to find whether you are going to Aden with us.' So I went to phone the ADMS of the day and said 'Am I going to Aden with the regiment?' 'No,' he said 'There's an order come through. You have to report to the Crown Agents in London about the Falkland Islands Dependencies Survey.' So I had to pack my bag and get on a boat that night and went to London where I was put up in the Headquarters mess of the RAMC in Millbank. Then I had to report to the Crown Agents the next day.

[Part 1 0:09:13] Lee: Who was in the building at that time? Raymond Priestley was there I think, wasn't he?

Norman: Yes, he was.

[Part 1 0:09:19] Lee: What did you make of him?

Norman: Well I arrived at nine o'clock of course and he didn't come in until half past ten for a start, and I found he was a very pleasant venerable old gentleman, whose first question was 'Why do you want to go to the Antarctic, my boy?' 'The Antarctic?' I said, 'I'm going to South America.' [laughs] Anyway I didn't quite say that but I kind of hid the thing and fudged it and fudged it. Anyway we talked basically about the Antarctic for a wee while; well he did, and I just listened. Then he got on to the question of his penguins and this project that a consultant that he knew in Charing Cross Hospital now wanted to pick this project up, and there was a huge penguin rookery there had recently been discovered beside Halley Bay, and they wanted this collection of embryos and would I care to do it? I said 'Yes, sure. I will do that. That sounds quite good fun.' Because as a budding surgeon I thought maybe that meant doing some Caesarean sections to get at the embryo, not quite realising that they were birds that laid eggs. Because I didn't know anything about penguins, you see. However I agreed to do this. It was all a very rapid process because we were

recruited and we were sailing in about a few weeks' time, and so I had to go and work out a research project which I did at the MRC in these days.

[Part 1 0:10:57] Lee: Did you also meet Anne Todd at ...?

Norman: Yes, I did meet Anne Todd.

[Part 1 0:11:00] Lee: Tell me about Anne Todd.

Norman: Anne Todd was a delightful person. I really liked Anne very much. When I had problems – logistics or anything like that – she was very very helpful. When I was writing my thesis, I just couldn't find a copy of *The Worst Journey in the World* which was important to me at that time. She immediately produced hardcopy² and a paperback. Anything that I asked Anne Todd about I got an answer to. I met her of course over the years when she worked with Sir Vivian Fuchs and so forth. No, I really thought she was first class, and I think she really supported both Priestley and Fuchs.

[Part 1 0:11:44] Lee: Are you suggesting that she was a 'power behind the throne'?

Norman: I don't think I knew her as well as that, but I think she probably gave them enormous support. I don't know whether she was able to influence them in that sort of way, because I didn't know her well enough. But she could be.

[Part 1 0:12:05] Lee: Had you sailed before?

Norman: No. Well you see I had been brought up during the War and I had never been further than Edinburgh from Glasgow, and I had never been overseas. I had sailed down the Clyde once or twice in a steamboat and that was my experience of sailing. So this was all very new to me.

[Part 1 0:12:27] Lee: So this was nineteen fifty ... ?

Norman: It was '58/'59.

[Part 1 0:12:33] Lee: OK, and what was the ship?

Norman: The Antarctic ship was the *Tottan*.

[Part 1 0:12:38] Lee: Oh right, so not a British ship?

Norman: No no, the *Tottan*, the *Tottan* from Tromsø and it had been the one that they had used for the establishment of the base in the Advance Party. So they had the *Tottan* which really was a pretty basic ship, 640 tons with old U-Boat engines, that sort of thing. We were berthed in two five-man cabins in the fo'c'sle. The food was largely cabbage cooked in caraway seed and vinegar which I couldn't eat because I didn't realise that I was going to be seasick. Because you see with a name like Nelson ... I had always wanted to go to sea but I had applied for the Navy but was

² From the context he may mean hardback (book).

subsequently told that with a name like Nelson I could thank my lucky stars that I wasn't taken up. Anyway I first of all felt queasy in Southampton Water and then I was very well under the weather all the way down until we hit the ice. So it didn't go away and any time that it became calm, when I thought maybe I could eat something, I approached the mess which was in the after end of the ship. As soon as I opened the door and smelled the vinegar and the caraway seeds and the fat (mutton or whatever it was) that was as far as I could get. So I didn't get much to eat.

[Part 1 0:14:25] Lee: Did you not eat for six weeks or so?

Norman: Oh no, I must have eaten something, but as little as possible.

[Part 1 0:14:35] Lee: Where does Dr Otto Edholm come into the story line, because I think you ...?

Norman: Well you see Otto Edholm was director of the Physiological Unit of the MRC, Human Physiology Unit and he had been taken on by BAS to look after their human research. They were starting a programme of human research. The chap there called Lewis, Harold Lewis, had been in the British North Greenland Expedition and he was part of Edholm's unit, and Edholm put him in charge of the Antarctic research. Edholm had written a lot about ... He was basically brought up in Canada, in northern Canada, and he had written extensively about human responses to cold. So he was a pretty switched on scientist, very good in fact, but we didn't have a lot to do with him, the BAS doctors. It was mainly Lewis that was in charge. But I had this very short period of preparation, and when I got there Lewis said 'Right, here's a copy of Dr Edholm's book. Go and read it and then devise a research project.'

[Part 1 0:16:07] Norman: I hadn't any research experience at all. I read the book which didn't actually mean anything to me at that time. I kind of worked out some kind of basic project which they helped me to put together and gave me some means of making a few measurements. There was a guy called Heinz Wolf who was a bio-engineer, a kind of mad scientist but a very very highly intelligent man, and he gave me some of his equipment which was a knitted vest that you could wear, of thermocouples, so that you could measure the sub-clothing temperature. Then he gave me a watch which had a thermometer sticking out, and that would allow me to determine how much time people spent in temperatures below zero. Certainly it stopped as soon as they went out but it didn't start when they came in again, so it wasn't all that great. Then I had an anemometer, an accurate wind thing that gave me the wind speed, and the wet and the dry bulb temperature – these were all the classical things you did for environmental physiology. I didn't quite know what to do with them but I had the equipment.

[Part 1 0:17:32] Lee: Did you know what you were looking for? Did you have a focus for your ...

Norman: No, I didn't know what I was looking for. I was measuring activity patterns and I was measuring the temperature that people were exposed to 24 hours of the day, in rotation, and writing it all down: both their activity and their exposure environment, as it were, in terms of temperature, wind speed and so forth, and what they were doing. But I didn't know what I was doing; I didn't know why; and I didn't know

what I was going to do with it. So at the end of the year I had this vast amount of paper and I returned to the MRC with this paper. The guys were all away doing something fancy in Aden by this time about heat acclimatisation. I was given a desk there and there was nobody else in the whole department, apart from the cleaner, and there was a limited amount I could discuss with the cleaner.

[Part 1 0:18:45] Norman: They put me up again in the headquarters RAMC mess in Millbank and next man up was a full colonel and beyond, and none of them were interested in talking to me either. So I was very lonely for a while, while everybody was away, and I started going to pubs and trying to meet somebody I could talk to. I wasn't very good at that, so I didn't meet anybody; I didn't have anybody to talk to. So then I started going to the pictures. I would go in in the morning and decide where I was going to go that night and eventually the next few years there was no film I could see because I had seen them all, pretty well. So it was a bad time and then I sat down and I said to myself 'Well, this is just ridiculous. I have to try and do something with this stuff, so I found there was a library as you might imagine in a place like the Medical Research Council. So I went and found a journal, the *Journal of Applied Physiology* as it happened. I found a paper which was really quite interesting. So I read a few papers and then I began to see how you could put this data together in some sort of way and I could read the literature. I began to work away at it and then I began to think a bit. Basically what I was told to do was find out about acclimatisation to cold. Well established measures of acclimatisation to heat but nothing seems to happen when you live in a cold climate. Why is that? That was the basis of the project.

[Part 1 0:20:35] Lee: Was that your idea or was that Edholm's idea?

Norman: No that was their idea.

[Part 1 0:20:39] Lee: So you were doing it all on his behalf, effectively?

Norman: Yes, well he was throwing out an idea. Why are humans not acclimatised to cold? So I didn't even know what acclimatisation was of course. So I read about that. Then I read what had happened when animals were exposed to the cold, when humans were exposed to the cold. That was one aspect, and then the activity thing I started, I could work that out a bit better, and I found that there had been quite a bit of writing about activity calorie expenditure and this sort of thing. There were papers on Sandhurst cadets in training and coal miners in Fife, this sort of thing, Olympic athletes. So I said 'Well OK. If I can work out the Antarctic explorers, then I can have something to compare them.' So I did that bit. Then I had this environmental stuff and I then read Edholm's book and found that some quite interesting things, that in these polar regions when the wind speed got up, the temperature tended to go down and that sort of thing.

[Part 1 0:21:50] Norman: So I started with my meteorological stuff, getting the double frequency tables worked out and so forth and so on. And then one day I was travelling the Tube from Millbank towards whatever the Tube station was to Hampstead, and I was thinking about this and somehow I could see through a haze what I was trying to do, and I couldn't quite grasp it. But I could see several strands here that were beginning to make sense. Then I found I had missed Hampstead and so I had to get

off and go the other way. Then I arrived back at Charing Cross, and it was 11 o'clock before I got off the thing, but I basically had a thought in my mind. I rushed up to the place and noted it down. I had got this concept then of three temperature grades: temperature of the station, the temperature that the guy was exposed to, and the sub-clothing temperature.

[Part 1 0:23:03] Norman: And I worked that out and annual means and this sort of thing and came to the conclusion that the reason that there was no real change in response to a cold climate was because body wasn't actually exposed to a cold climate. I worked out how long they had spent out of doors and found that that was related to the climate too. When it was cold, the guy didn't stay out too long, and that the human was, had to be, maintained in a very close environmental temperature to survive, and that was the sub-clothing temperature. And why it was different from animals was that human beings could use their intelligence to clothing, their heating and their housing to assist them to maintain the environmental temperature that they needed. Which was actually quite a new concept at that time, and I was quite pleased with that and I wrote that into a thesis.

[Part 1 0:24:14] Lee: How was that received?

Norman: Well when I spoke to Harold Lewis about it, he pooh-poohed the whole thing. He said 'We are not interested in theses here. We are only interested in papers. Go and write a paper.' I wanted an MD thesis you see. So I went away and mulled over this thing and I thought 'Well, I will go to see Edholm.' So I went to see Edholm, who was the 'holy of holies' at that time and I was rather surprised to be ushered straight in, because he was expecting a high heejin from the Medical Research Council, called Nixon.

[Part 1 0:24:59] Norman: He had got the names mixed and he was about to throw me straight out and I slapped a diagram down and then I slapped another one down and he got interested in the thing and he got quite fascinated in what I was trying to say, and at the end of the day he was really quite impressed. I said 'What I would really like to do is to write an MD thesis and could I have your authority to go to Glasgow and present this to Professor Garry and so if ...' 'Of course,' he said 'You must. Tell him I sent you.' So that was it. That was the turning point in my career really, and I came out of that place with an absolutely splitting headache. And then of course I eventually wrote the thesis and went to Glasgow. He thought it was good. He was keen on it too. He said 'Yes, get that in.' Then Fuchs by this time was back from the Antarctic and so I presented it to him and he thought it was absolute rubbish, because he thought I was taking the piss out of the Antarctic explorer, saying it wasn't really rough.

[Part 1 0:26:17] Lee: De-macho-ing them was it?

Norman: Yes it was de-matching. I said 'No, they are just using their energies and strengths to all hours to function, and that wasn't liked either. The Cherry-Garrard's book with metal fillings contracting and being spat out. Because I rather facetiously and stupidly said that the mouth would be colder eating an ice cream, which it would. So anyway he was unimpressed. Anyway I presented the thing and I left him a copy, but the interesting thing about that was that ten years later, when Edholm was about to

finish up, he had a conference in Cambridge which Sir Vivian was invited to open, and he was quoting my thesis by the yard by that time. [laughs] So I ended up all right.

[Part 1 0:27:10] Lee: OK, so you are now on the ship, travelling South, not feeling terribly well. You are off the bay at Halley. As someone who wasn't really intending to go to the Antarctic in the first place, what was it like for you, to suddenly arrive at this desolate place?

Norman: When I saw Halley it was nothing, it was just ice you know. But no, I was quite interested in it, keen to get in, keen to get to grips with the job and with what we were doing. I was quite happy about it by that time. My sister had said to me when I told her I was going to the Antarctic, 'But you don't even like a draught!' However I was very much involved and interested in this job that I had acquired. So, my impression was interested, really.

[Part 1 0:28:08] Lee: By this time the hut ... The hut at that point belonged to the Royal Society, and it was being transferred to FIDS I think, wasn't it?

Norman: That's right.

[Part 1 0:28:16] Lee: Was there some sort of ceremony or was it just a ...?

Norman: No, we were too busy really, with the unloading and the reloading, and there were two teams. I was on the ship with the unloading team. We hardly met the other bunch, you know. We just sort of ran into them and they were all so busy with packing up and getting out, and we were trying to get in, so that there was very little intercourse. I suppose we had a party when we arrived on the ship, where everybody got drunk, and then there was a monumental party before they left. As I said, I think we were all quite glad to see them go so that we could get on with the thing and do what we had to do. And of course we had a Norwegian crew too, that we had tried to be friends with but none of us could speak Norwegian, and they were part of this carry-on as well.

[Part 1 0:29:16] Lee: Were you expecting to be living underground?

Norman: No I didn't really. We weren't told that. [laughs] But it wasn't a great shock. It wasn't really a great shock.

[Part 1 0:29:32] Lee: It wasn't?

Norman: No. I didn't find it too much of a shock, although I was surprised I suppose. By that time we had this great shaft that you had to climb down to the front door, and the back door (as we called it) was through the roof, where there were sort of boxes and you had to keep adding another box, and you could get in the back door that way.

[Part 1 0:29:55] Lee: It was a shaft you mean, extending the shaft upwards?

Norman: Yes. Extending the shaft to the front door, but the back door through the roof, you just had to get adding a sonde box onto it. It didn't get buried quite so

rapidly because by that time we had discovered that if you left things sticking up in a blizzard, then it levelled very quickly, and so we didn't leave things sticking up that were avoidable, and it didn't accumulate quite so rapidly. There was a learning process in the whole thing really.

[Part 1 0:30:28] Lee: Was it at all luxurious, this subterranean hut?

Norman: Well it was to a certain extent, in that it was warm, and in these days of course at home we didn't have central heating and winters were cold. I mean I grew up in a house with coal fires, maybe a couple of coal fires, and draughts everywhere and it wasn't very warm, whereas there we had a comfortable lounge which had a great big coal fire in it, a closed coal fire. The bunkrooms were very warm. We weren't used to sleeping in a nice warm bedroom. So to that extent it was luxurious, I suppose. The food was all right. The Army cook was a good cook but he couldn't really be bothered too much with the cooking, but that didn't matter too much because he could produce magnificent feeds at birthdays and Christmas and so forth. It became more important during winter when people didn't have much activity and when their appetites went off and when they got a bit dejected with boredom and so forth. But no, it was all right

[Part 1 0:31:56] Lee: What were the medical facilities like?

Norman: Well when I was taken on I was told 'They are all very well examined, so you won't have any illness. They are all fit and healthy.' And they were giving you the medical equipment of a battle cruiser, so that you had plenty of stuff to cope with. I said 'Oh, that's fine.' The youth of a newly qualified doctor, that he could cope. Then in the way down I thought 'This very healthy crew ... ' I thought of my own medical examination, which was done by some old colonel or other, which consisted of 'pee in a bottle and cough'. I thought 'That's not much of a medical examination.' and of course there were a few people who had problems that I had to cope with. Then this great mass of drugs, most of which I had never heard of, and a lot of equipment. In years and years I wondered what Horsley's Wax was used for, for example, and I only discovered it when I was a consultant surgeon. [laughs]

[Part 1 0:33:13] Lee: What is it used for?

Norman: When you open a skull, the bone bleeds, and this is a wax stuff that you put round the cut edge of the bone to stop it bleeding, so I didn't think I was going to be doing any brain surgery. [laughs]

[Part 1 0:33:30] Lee: So what sort of medical work did you find yourself having to do? Don't name names of course but examples of the illnesses or conditions you had to deal with?

Norman: Well the first thing I did was I organised a proper sick bay, and built myself an operating table in case I had to do something, and was quite delighted that I didn't when it came to the bit, although I rather thought I could cope with it if it happened. Then, well lots of cut fingers and that sort of stuff, basic stuff. But then there was dental problems too. I found I had to take out a tooth, for example, which I had been taught to do by the Army before I left. So that got through it all right. Then somebody

jumped on a piece of wood with a nail sticking out of it, stuck into his foot. These were the things ... I think the most difficult one, because I didn't have any really serious illnesses, was with the auroral observer who spent his time sticking his head out every night, to see the aurora and taking pictures of it, then coming back in again. I worked with him as a kind of assistant auroral observer. His nose started to bleed, and it gushed with blood.

[Part 1 0:35:01] Norman: In retrospect, I think this was this gymnastics, expanding and contracting every night in the intense cold and in the dryness of the hut (because it was very dry). So I did the usual thing; I packed his nose and left it for a few hours. I took the pack out and it started to bleed again so I did it again, twice. I left it for a day, then two days. Every time I took this pack out, it bled again. What I really needed was a cautery. I didn't have a cautery. So I discussed this with the other mate I had, who was the diesel mechanic. We went out, we got a heating plug out of a tractor, for starting it, and he hammered this into a kind of cautery thing, and we rigged it up with a heavy duty battery. We stuck this up this guy's nose which was then pouring with blood and shouted 'Contact!' It contacted; we took it off again and there was smoke coming out of his nose, the smell of shoe-ing a horse, and the bleeding stopped. Fortunately his nose didn't come off. But that worked and that was about it. We had a few other people who had troubles but I think probably the most difficult thing to cope with was the depression of winter.

[Part 1 0:36:41] Norman: This arose over Mike Sheret, went away with the penguins. He came with me to do the project in Emperor Bay. That was pretty hard going and we had to really work very hard and work out how to cope with things. Eventually it worked and we came back to the base having been away for six to eight weeks and the place was absolutely silent. There was no sound. It was normally a busy place, there were people rushing around, and we discovered that they had all retracted into their own little corners, very often just on their own. In the roof space they had got a little nest, as it were, and they weren't talking. Normally we had little groups that got on quite well together. They met of an evening and this sort of thing. I talked to them, the people I was palley with them. They weren't responding and so I then found in my new sick bay. I went in there at 9 and there would be a tap at the door and somebody would come in. They were all depressed and I would chat away to them about this. Eventually they came out of it. They were reasonably happy, went off and later the next one came in and it was one after the other. At the end of the evening I said 'I think I am depressed too. There is nobody to talk to me.'

[Part 1 0:38:21] Lee: Was there any cure or treatment you could offer?

Norman: No not really, apart from just chat, counselling.

[Part 1 0:38:33] Lee: Did it help? Did things buck up?

Norman: Yes, I think it did help.

[Part 1 0:38:37] Lee: Let's spend a few minutes talking about the penguin embryo saga, because this was ... Apsley Cherry Garrard and Wilson tried to do this, didn't they, on Scott's expedition? Were you picking up their research?

Norman: Well you see, if you think of the turn of the century, it was all about the chap who was involved in evolution, Darwin. That was the phase of Darwin, with his evolutionary theories, and all the big scientists of the day were looking at evolution and evidence thereof. They looked at the emperor penguin: was it a bird that couldn't fly or was it a fish that was amphibious, or was it even a reptile because they had a skin a bit like a reptile? So they thought this may be the kind of fish to land junction. So they thought this was really quite an interesting topic.

[Part 1 0:39:57] Lee: Darwin's 'missing link'?

Norman: Yes, Darwin's 'missing link'. Nobody had ever seen the breeding ground of an emperor penguin because they come in in the dark to a bay some place and lay their eggs, and then bring up their chicks and then they go to sea. Then the sea ice goes out and all trace is lost. So nobody knew what happened until Wilson discovered in Cape Crozier by accident in the first expedition they were near to an emperor penguin rookery. So he knew where it was. Then he got fascinated with this and he talked to a chap in the Natural History Museum, Professor (I forget his name; it is in the book³) who was equally keen on this thing and so they thought 'We're going to get some emperor penguin embryos, so that we can work out whether this is the great missing link or not.' So Wilson persuaded Scott to allow him to have a go at going to this Cape Crozier in winter. Actually Cherry Garrard was a very junior zoologist who was part of the team, and Bowers (I think it was) was the third man in this group.

[Part 1 0:41:13] Norman: So they were determined to get to this rookery and eventually made it in the way it is described in that book, in dreadful conditions: abseiling down, grabbing five eggs, breaking two on the way back. That when their tent had blown away and all they could do was survive just by the skin of their teeth. They would get back, which was what they did with three eggs. Bowers of course and Wilson both died. Then Apsley Cherry Garrard brought them back and took them to the Natural History Museum to find that the guy had died, who was interested in them, and nobody else was interested in the thing until Captain Scott's sister I think (or wife, I don't remember which it was⁴) hammered the table at them and they took them on and Cherry Garrard went off to war. Because it was 1914 by that time. Somebody else⁵, in Edinburgh, had a look at them and that was as far as it went.

[Part 1 0:42:18] Lee: Were you in fact picking up that work?

Norman: Priestley then met this chap in Charing Cross Hospital, an anatomist, and they were discussing it, and the anatomist said 'I would like to finish that project, but I would need a series of timed embryos to do it.' as an embryologist would normally say. So Priestley said 'OK. I will see what I can do.' He batted it to me. That was how it came about. So I said 'Sure, I will do it.' but without recognising what it entailed.

[Part 1 0:42:55] Lee: What were the privations?

Norman: Whose – mine or theirs?

³ Richard Assheton.

⁴ Sister.

⁵ Cossar Ewart.

[Part 1 0:43:01] Lee: What were the things you had to overcome to collect those eggs?

Norman: Oh, I see. Well I mean George Lush was really key to the whole thing and saying 'Well you have to go and live there for a start.' He built the caboose and took it down with a tractor and he gave us a little generator that gave us the heating and a primus stove to cook with. We put stakes, bamboos, all the way down and connected them so that we could feel our way in the darkness back to the base. And we used telephone wire (because remember I was the doctor) and there was a case actually that I had to go back in a blizzard to see. But that was another interesting one actually. Remember that hut that we were building there? This guy was moving his hut after the blizzard and he started coughing blood after that. So they sent for me and I went back and I knew there was nothing I could do but I had to go. This is a thing that they get in horses in Alaska, where you get spicules of ice in your lungs. That was what he had.

[Part 1 0:44:16] Norman: But anyway that was justified, doing that. So that was us established there. Then we went down to the sea ice and saw the penguins coming back in and didn't quite know what we were going to do. I thought 'Maybe we will have to sort of take a sample.' So we build a kind of crèche thing. We didn't quite know how hard sea ice was either, so we got some stakes and some chicken wire, spent a day trying to hammer these things in and made a hell of a din. When we finished that, we found that the whole rookery had moved. We had to go and catch this set of penguins and bung them in. Of course we didn't know whether we were getting males and females, or what we were getting. We had a bunch of very bedraggled looking penguins in there, none of which seemed to be the slightest bit interested in laying eggs or reproduction of any type. So it was just one problem after another. Eventually, when the laying season was almost finished, I wandered around this rookery and I saw this bird coming out of the huddle, and I was watching it, and it was kind of ... almost looked like a female in labour in that there were contractions in its front. And it laid an egg! Another one came out and it laid an egg too.

[Part 1 0:45:52] Norman: It took about twenty minutes of labour before the egg appeared. So I said 'You know we are not going to get time here.' So we kept them back up at the base in collecting other things: coal bag (a means of catching them). It went on and on. So we then got Dexion and we made cages. I found a penguin in labour and signalled to this guy Sheret who got a cage and a sledge and gradually came up behind it when the egg was laid, slid this cage over, shut the door, tied it and put a number on it. I said 'That's great. We haven't got too much time to go before the end of this laying season but we will maybe get our eggs now.' That went on until three days. Not having read the literature or knowing anything about penguins, I didn't know that at the end of three days the female passes the egg to the male, and then the female goes off to sea, and the male incubates the egg. So we were left then with eggs that had been discarded previously, so we reckoned that we had to try and get the father as well. Then we observed almost human behaviour. The female would come out and start the laying process and the father very often came too. You could recognise the father penguin. He would be marching up and down in a state of agitation just like a human father. We got the female in; but then we had to identify the father and chase him and catch him and sling him in the thing as well, and wait for three days and ...

[Part 1 0:47:47] Lee: The dissection of the egg was done back in the caboose?

Norman: Yes.

[Part 1 0:47:53] Lee: Not back at base? In the caboose?

Norman: No, it had to be done there and then.

[Part 1 0:47:56] Lee: For obvious reasons? It would go off, I suppose?

Norman: It was done ... I had to get it back from the sea ice up to the caboose too and keep it warm. So what I did then was I got a sea-boot stocking and I put it down inside my clothing. When I got the egg, I insinuated it down, because it was a good half hour back up to the caboose. I got back up there and then had this little table and a bit of Plasticene. What I had to do with a hacksaw because it was quite a thick shell you see; get a little flap up. Then I had to go down. The embryo was sitting on top of the yolk, so I had to go down through the white part and dissect this little plaque off the top of the yolk and get it out. I perforated the yolk and then I couldn't see anything, so it was a disaster you see. That was quite delicate, the dissection that had to be done. Then it was taken out and put into Bouin solution. That fixed it for a start and then I took it back up to the base subsequently and transferred into another solution.

[Part 1 0:49:16] Lee: Were you able to collect the timed embryos according to the scale that you were asked to do so? And these eggs all went back to the UK?

Norman: Yes.

[Part 1 0:49:25] Lee: On the *Biscoe*? Was it the *John Biscoe*?

Norman: It was on the *John Biscoe*.

[Part 1 0:49:28] Lee: And when it got back to the UK, was there a welcoming party formed?

Norman: Well I thought I would be knighted, as Drake was, when I came back and I was thinking of all sorts of things. I was also in a great state in case the taxi going across London had a crash and I lost them all. Anyway I eventually got back and I took them to Charing Cross Hospital where I met a rather frosty-faced secretary who said that Dr Glenister was now Professor of Anatomy and he was a very busy man and I couldn't see him. 'Just leave them there,' she said. 'and I will pass them on.' So I was a bit non-plussed but I did so because things were very busy then. I had to get back into society, as it were, and get on and get to the Medical Research Council and go to the Army and go and see my parents in Tain, and this sort of thing. So I left them and then the research box that had all the vast number of papers I had collected, it didn't arrive, and I was told it had been lost in transit. So the Army sent me off on terminal leave, this thing they called that six weeks of leave.

Part 1 0:50:53] Norman: I was living in Tain at that time, and I went away up there. I was told I didn't need to come back because it was lost. Then I went to Glasgow, to my old hospital, and got a job as an SHO⁶ in orthopaedic surgery. I arranged that. I would start in a month's time. I was just about to go there when they said that this box had turned up, so I should now ... I almost felt like telling them to throw it away because I didn't know what I was going to do with it anyway. But what had happened was: it had gone into Montevideo and then had been transferred to some steamer or other which had gone to Southampton and then gone to be broken up. So I said, originally, 'Can I go to Southampton and look at the whole of this boat, and see if I can find it?' 'Oh no, it's all away to be broken up.' After six weeks the box arrived in London, having been to four depots of British Road Transport, and taken all that time to get there.

Part 1 0:52:06] Lee: What was the final conclusion of the embryo work you did then? Did you link the penguin with the dinosaurs?

Norman: Well I went off to become a surgeon and my MD and all the rest of it. It was a very busy period of life, and eventually, when things began to settle down, I said 'Well I wonder what happens to these things?' So I wrote to Bill Sloman, who was still running BAS logistically, and said 'What about this? I haven't heard anything or seen any writings about this.' I said 'If they are not prepared to do anything, I will take them back and I will get my own embryologist, and I will work them up.' So he made enquiries and he found that they had been thrown out.

[Part 1 0:53:03] Lee: So they met the same fate as Apsley Cherry Garrard's?

Norman: Exactly. Exactly the same fate as Cherry Garrard's.

[Part 1 0:53:10] Lee: Did you have any scary moments in any of your time in the Antarctic?

Norman: Well as I mentioned, somebody nearly went over the cliff. That was me.

[Part 1 0:53:19] Lee: Oh, was it? On the film show earlier, on a tractor?

Norman: On a tractor, going backwards and forwards with the loading and the unloading. It was just marginal with the vision, and I had gone off the track that we had. There was some sort of sixth sense made me stop and get off and I looked and I was right on the edge of the cliff. So that was a wee bit of a scary moment.

[Part 1 0:53:45] Lee: You refer in the book to a kind of guardian angel, that might have been ...

Norman: I think that was a guardian angel that stopped me.

[Part 1 0:53:51] Lee: That was it, was it?

⁶ Senior House Officer.

Norman: Then of course you do daft things like, careless things. The time when I had to go to see this boy who was coughing up the blood, from Emperor Bay. We had run out of bamboos and there was a bit between the last bamboo and this hut, which didn't have a string, and there happened to be a blizzard that night. I thought 'I will just walk up and catch this thing, and after walking quite a distance, I recognised that I must have missed it because I didn't come across a bamboo or a bit of string. I walked on a bit further and then I thought 'My God, there is nothing between me and the South Pole that way, or over the cliff the other way. So I got a bit of a fright there. I walked up and down and eventually hit the things. So that was a frightener. It was a stupid thing to do. You do stupid things at times. But that was about it.

[Part 1 0:55:00] Lee: Medical and scientific research has moved on a bit since the days of your penguin egg experiments, but how much? Is the core of it still the same, or has it changed completely?

Norman: How do you mean?

[Part 1 0:55:16] Lee: The principles that you were working to with your penguin eggs, are they still employed today in that kind of medical research, or has it all been turned upside down by progress?

Norman: Oh there's an awful lot of change in technology and things that you can do nowadays with the inventions of things like electron microscopes and ... I mean when I was doing my thesis, working out the statistics, I had a Facit machine (as we called it), winding it backwards and forwards – that took ages to do. Nowadays you would just put the machine in a thing and press a button. Again, I got involved with other people's research in the Antarctic, which was one of the advantages of being in, because I had never heard of geomagnetism or ionospherics, and this sort of thing. Being bored in winter time, I used to say to the scientists 'Is there something I could do?' The analysis of the magnetic charts was a thing: you put a thing called a planimeter over it and you had to work out the average shift of these things, and that took ages for a complex chart. Nowadays it would just go into a computer and it would be done. Then, talking to Ray Adie who was the Deputy Director, his big thing was mapping of the Antarctic coastline. Then they produced an aeroplane and took aerial photographs, and he told me 'My whole life's work could be done in two or three days, now.' So I think the whole thing has turned on its head now, as far as research goes. It is much more critical and much more rigid. I mean I have been in research all of my life but it has changed, there is no question of it.

[Part 1 0:57:18] [End of Part One]

[Part 2 0:00:00] Lee: This is Nelson Norman, interviewed by Chris Eldon Lee on the 24th of September 2013⁷. Nelson Norman, Part Two.

[Part 2 0:00:11] Lee: How did the whole concept of remote medicine arrive in your life, Nelson?

⁷ He says 2013 but means 2012.

Norman: Well you see I then, when I left BAS I went to become a surgeon, which I duly did. I became an academic surgeon, largely on the basis of what I had done with BAS too, and got into a very fine unit in Glasgow and set up there, and then went to Aberdeen and duly became a surgeon. And that was my whole life, and that's all I ever wanted to do. I was achieving that and rising up in the ranks and almost becoming a professor myself, of surgery. Then suddenly the North Sea erupted and this great industry landed in the North Sea.

[Part 2 0:01:09] Lee: You mean the oil industry?

Norman: The oil industry, yes, the oil and gas industry, and nobody quite knew what to do about it, medically speaking, because it was unexpected and new. Aberdeen was a kind of peripheral area; it was a farming community and a country area and we weren't used to this. The big thing at that time was diving, deep diving, saturation diving which was barely out of the experimental departments of the Navy. Yet they were trying to use these techniques to establish offshore structures. Also they were used to the Gulf of Mexico and the Gulf of Arabia, where it is hot, and here they were in the middle of a very difficult environment in the North Sea where it was very cold, and they were a long way from home. So these were the three big problems they had.

[Part 2 0:02:14] Lee: Were there casualties?

Norman: Yes, there were lots of casualties because (a) the diving thing wasn't really established; they weren't very used to constructing offshore structures; the industry was new to it, and there were a lot of big accidents, both in the top bit and in the diving scene.

[Part 2 0:02:38] Lee: What was the initial way of dealing with these men, once they had been injured off the coast?

Norman: They took on doctors who were, they just found, you know, GPs (some of them very good GPs) that an oilman met in a pub, that sort of thing, and they weren't really up to it. They had got helicopters, and so they could have bundled him into a helicopter and flew him ashore, and it really was a bit messy. Then it began. They didn't quite appreciate that they were now in the middle of a very civilised, sophisticated sort of society and not in Arabia or in these places where ... What the oil companies then did was they just built a hospital of their own, staffed it with their people and dealt with injuries. They couldn't do that in the North Sea. Also they were fighting with the Government departments who said 'Well, we have got a National Health Service and we are not responsible for what happens to you. You will have to look after yourselves.

[Part 2 0:03:54] Norman: So what eventually happened there was that it got to such a state that a chap called Colin Jones, who was the only doctor from the oil companies that was based in Aberdeen, he came to see me and we sat down and talked about this. Why me? The reason was that I knew about the cold because of my Antarctic background and I was researching hypothermia anyway for surgical reasons. (2) I was working in hyperbaric oxygen for surgical reasons, this is diving. And (3) the basis of the research team that I had was to do with the beginnings of intensive care and what we were talking about was the management of serious surgical problems a long way

from home, one stage more difficult. So it seemed that I had the basic background and I was at a stage then too where I was beginning to get a bit sick of being somebody else's department and I wanted a new challenge.

[Part 2 0:05:01] Norman: So we teamed up and we decided, well, we would try and do something about this. We thought (or he thought, really) ... 'It's such a big subject, a new subject that hasn't been tackled before. It's not a thing that you can just do in a small area. We need an institute of some kind. How do you form an institute?' So we had a conference which is the way you start these things. He had all sorts of contacts in the industry and we got the Navy involved because of the diving. The Professor of Surgery had been in the Navy and was quite interested in the thing and the Medical Director General of the Navy, he was a surgeon, so he was our external examiner.

[Part 2 0:05:54] Norman: We were able to collect quite a number of people who were appropriate and in a couple of weeks we held a conference in Aberdeen which concluded, because we had decided what the conclusion was before we started, that we needed an institute and we wanted it in the university because it really needed to have an academic base. The Principal of the university was persuaded that this was a reasonable thing to do. He said he had no money and we said 'That doesn't matter. We will make our own money. We will fund it ourselves.' Now that was fine because we had already worked out that to do this what you needed was three components: you needed the medical service thing; you also needed training because nobody quite knew what training was necessary, and we needed a research base. So these three components were, I thought, essential.

[Part 2 0:06:57] Norman: However, when it came to setting the thing up, neither Colin Jones wasn't the senior man in the oil industry and I wasn't the senior man in the academic scene, so we weren't invited to this meeting where this discussion took place, although we had primed the guys who were there, and they decided they would establish an institute. Now it was the Professor of Surgery who was my boss and it was the Shell guy who was Colin's senior man, and so they set this thing up amongst them. My professor thought he could see this was quite a big thing and it might be a nightmare if we didn't have something like that. I shouldn't say that but nevertheless ... So he said 'I will run it.' So I was told to go and write a thesis or something.

[Part 2 0:07:55] Lee: 'Go boil you head'?

Norman: Yes. 'Go and boil your head, and I will run this.' However, when it came to the pit, I was the guy that had the experience and the background in the cold and did the diving and all the rest of it, and so when the problems arose, they came to me, and I got him a bit annoyed, and I had to sort out these problems which I did with interest. Then we established courses, we got a bit of research going, and I was a Reader by that time, so I had my own area that I could work in and I had a desk. It was beginning to take shape, but it was awfully difficult because the universities of these days were not as they are now. They weren't very well managed and when we were making our money on providing appropriate training for people who were working in offshore installations, if we said to the Finance Officer of the university 'Send an invoice to the BP Training Department for a couple of thousand pounds,' something like that, then what he did, he would send them a cheque for two thousand pounds instead.

[Part 2 0:09:18] Norman: So we got to this sort of 'Ha ha' business. 'Stupid old university, sending me a cheque. They don't know how to run a business.' And that began to get a bit irritating. Then when I said 'Well if we were a self-funding university department, and this is how it was established, how can I work out how to do this? I don't have a feel for the finances coming in and going out.' 'We will tell you. Every six months you will get a ... ' 'That's not good enough.' I got so annoyed I went to Colin Jones then and said 'Could we not be some kind of a company that would run?' Because I was then chatting to companies, because I had never been outside a university and I was quite impressed with the efficiency and management and this sort of thing. So he said 'Well you could become a company. It is easy enough to establish a company, but you would just be like any old company that is around, and there are all sorts of companies growing up, trying to sell things to the oil industry. We need the NHS bit and we need the university.' So he would think about it. At this time a chap called Matt Linning who was a very powerful guy appeared on the scene, a Glaswegian who called a spade a shovel, as the general manager of BP, and he was interested in human factors. Colin obviously had chatted to him and then the pair of us went down to BP's New Venture department.

[Part 2 0:11:02] Norman: Now they were setting up things with a profit like forestry commissions and all sorts of businesses peripheral to the oil industry. So we chatted all day to this guy and I told him what we were trying to do and how we were not just looking at the oil industry but I was interested in the community too, because there were mountains around us. There was mountain rescue; there was fishing; there was agriculture, and they have all got problems of their remote areas, and it was beginning to develop that the same technology, the same medicine could work because the bottom end of Kintyre was just about as remote as offshore. The same medicine was needed. So he got quite interested and decided that maybe the answer was a university company that the oil industry would set up. So I was quite pleased with that and went back.

[Part 2 0:12:03] Lee: So what happened?

Norman: Well what then happened was that I didn't expect anything to happen for what some time because it takes a long time in the university environment for anything to happen. However, very shortly thereafter the industry approached the university about establishing a company and that duly happened. It was called Offshore Medical Support, established within the University of Aberdeen. It was the first university company, because we didn't have university companies in these days and so there was a meeting called to discuss this, but as usual I wasn't invited. [laughs] I wasn't invited to my own concept.

[Part 2 0:12:49] Lee: What kind of ...? Once you had established this new body, this new company, what kind of service were you able to offer to the oil rigs? Were you medi-vac-ing people? Were you doing tele-medicine?

Norman: No, tele-medicine came a long time after that.

[Part 2 0:13:07] Lee: Give me a thumbnail sketch: the kind of products, the kind of things you would have to do?

Norman: Well what we had to do was solve problems. That was where the research thing came in. For example there were terrible outbreaks of infection in divers' ears, which had never happened before, and that was aborting dives which were costing them about a hundred thousand a day, and they had to stop them. So that was a big thing that had to be done. Then of course there was the question of what you do with a diver that is in a pressure chamber and he gets sick, because you can't get at him for about six days. So we had a great argument about transferring them under pressure in a kind of hyperbaric stretcher sort of thing, to a big pressure chamber on land which we didn't have either. That took years to work out. The alternative was to train a bunch of anaesthetists and surgeons, take them offshore, and then if you really had to do something, go into the chamber. And we had to work out who went into a chamber because your brain doesn't work so well with nitrogen narcosis. So you put the junior guy in.

[Part 2 0:14:26] Norman: Then we had the problem of chest pain, because if you get chest pain you get maybe a pneumothorax. If you try to decompress someone and you've a pneumothorax, then you can kill them, and that was what really got the thing going in a big way, because some GP that a diving company had taken on, was a bit arrogant and said this was a case of pneumonia. They had to decompress him. The diving supervisor, who very experienced, said 'No it is a pneumothorax.' The doctor overruled him, they decompressed him and killed him. So that was the state when I laid down the law and said 'This is just nonsense. We have to get this properly worked out and done'. So we got the whole diving scene organised then. Then it took ages before we got all these answers. I mean chest pain: I said 'If you could only have a stethoscope that you could interpret...' And they said 'Well, why not?' We drilled a hole in the chamber and we put an electronic stethoscope in.' So that you could look through the porthole and the diver was in and you could listen outside. It was really, not rocket science but it made a huge difference.

[Part 2 0:15:46] Lee: At what point in this process of setting up the Offshore Medical Services did you think this could be applied to the organisation you used to work for; this could be applied to BAS?

Norman: Well at that time a chap called Hadley approached me, who wanted to go to the Antarctic.

[Part 2 0:16:06] Lee: As a doctor?

Norman: A doctor, yes. Montague Hadley or Donald Hadley, and he said he did and I said 'Well...' He said he had a fiancée who lived in Aberdeen. I told him to go down and see BAS. I said 'You could say to them that we could look after you before you went, and get your training that you might need for service there, and set you up with a research project, and even look after your research while you are there. See what they say.' So he went down and they said 'Ah, why not?' Then Bill Sloman came up and he was recruiting for BAS; he came in and we had dinner together, and I said what we were doing and I said 'It would be quite interesting to do this for BAS, if you like.' So he said 'I think that would be useful. Why don't you come and talk to the Director.' So I said 'OK.' I went down and saw Ray Adie who came up and he

thought it was quite a good idea, that we should have an association and so that was really how it started.

[Part 2 0:17:24] Norman: It wasn't deliberate or anything like that. It was just that I was interested in the ... involved with BAS. It wasn't anything to do with the oil industry at all. In fact nobody really approved of what I was doing because BAS didn't have any money and we were short of money you see. I said 'I don't care about money.' I wanted to do this and so we set that up as a separate thing altogether. Then gradually we developed it and the thing that happened was that it seemed to me that they were related. It didn't seem to anybody in Aberdeen that they were related because even the oil industry said 'This is stupid.' And the university were horrified because I was spending a bit of money. However I persisted with this and then I was given £400 by BAS to fund four research projects for four doctors, all of whom wanted a project that would yield the Nobel prize. That wasn't very easy!

[Part 2 0:18:36] Lee: But I think you started off by taking the responsibility for training doctors before the Antarctic. Is that correct?

Norman: No. We started off by ... I started off by being responsible for research.

[Part 2 0:18:51] Lee: But then you took on, after a while, ...?

Norman: The reason that that happened was that Otto Edholm was responsible for research. He was opting out by this time, and I was asking advice from him about the research I was trying to establish in Aberdeen. Then I succeeded him as the research director for BAS's physiology. Then that Hadley thing worked out quite well, but what happened there was that he came back to me if he had a problem, instead of going to Port Stanley.

[Part 2 0:19:32] Lee: Oh right. BAS's medical services had been run by Port Stanley up until this time?

Norman: That's right.

[Part 2 0:19:38] Lee: So basically you were taking over their role?

Norman: It happened that way because having got his training in Aberdeen, he automatically phoned up and said 'I have got this problem. Can you help me?' which we duly did. Then I went a bit further and went to see Dick Laws about the thing, who thought this was all quite a good idea. I said 'You know it's a terrible problem you have got this, of recruiting.' They couldn't find doctors. Hadley was about the first one that they had. I said 'Well if your medicine was based in a university campus, then we could provide the training for them before they go to the Antarctic and we could sort out the problems that they had there, and when they came back ...' (because they had a year of write-up) I said 'we can help them with that but at the same time introduce them to whatever specialty they want to follow and maybe help their footsteps on the ladder that they want to follow.' I said 'I think that might work.' And Dick agreed with that and so that was how we got the thing going, but I was still only really responsible for the research, but these doctors that came there then, were

appointed and came there and had their training, but they all then came back when they had problems.

[Part 2 0:21:15] Lee: In the field, do you mean?

Norman: Yes, problems in the Antarctic, and what I had set up at that time with the consultant corps in Aberdeen, were all involved in giving them the appropriate training in the areas that weren't part of the medical curriculum, very willingly and very keen to do it in a totally unpaid sort of way. Then when there was a problem, if it wasn't in my field when they came to me, I could just go to the dermatologist or the ENT surgeon or whoever and got their advice and could give them consultant advice there on the spot and it worked very nicely. Then the next thing that happened were that a few disasters took place.

[Part 2 0:22:05] Lee: Where?

Norman: In the Antarctic.

[Part 2 0:22:07] Lee: For example?

Norman: Well the first one was, I think it was Halley, there was a chap who started coughing a lot of blood and having night sweats, classical features of open pulmonary tuberculosis. This was at the end of the season too. So they said 'How long do you think this could be?' So I went to a chest man and said 'You don't get open pulmonary tuberculosis any more, do you?' He said 'I have had quite a few cases from the fishing fleet around Iceland recently. So you can't say that. I will tell you what,' he said, 'you get me his pre-employment chest film and I will give you a good idea whether is likely to be that or not.' So I phoned BAS and said 'Send it up and we will see what we can ...'

[Part 2 0:22:56] Lee: The X-rays?

Norman: The X-rays. Then they came back and said 'I am afraid the guy that did his medical forgot to X-ray his chest.' So there was a bit of a problem there because we then had to isolate this guy in case he did have this and was going to infect the rest of the base. So he had a horrible time. The Otter was still there and we sent it up to Chile (I think it was) denuded all the chemist shops of anti-tubercular drugs in case we had to use them in the winter, costing a lot of money and trouble and so that was really a bit of a disaster. Then, I think it was the next year, the second thing happened, and that was that somebody got a jaundice and a great big enlarged liver, which could have been hepatitis, infective hepatitis which is really a very nasty sort of thing. So what were we going to do about that? I went to see the Professor of Medicine about that and he agreed that that was a very strong possibility and we had to get him out. I said 'We can't get him out because he is in for the winter.'

[Part 2 0:24:11] Norman: So there he was, another, second chap that had to be barrier nursed and isolated, and what were we going to do then because we couldn't then send another team in next year (half of them you know go in) to an infected base if it was hepatitis, unless we had a diagnosis. How were we even going to get this guy out? Because it might mean if we got him out early in a plane landing at somebody

else's base, we couldn't introduce hepatitis risk to that. So after a lot of carry-on we decided that we needed blood and we needed to get blood out as soon as the planes could get in and get it out. Then the ship was going down with all the next year's crowd but it was agreed that the whole thing would have to be aborted if we couldn't get a diagnosis, if we couldn't determine whether this was hepatitis or not, because we didn't know whether it was. So we had a very dodgy sort of time, with Dick Laws on the phone about every day, or every second day 'What the hell is happening?' 'We haven't got the blood back yet.' They were going to abort after Montevideo if we didn't have an answer. Eventually the blood did come back and it wasn't hepatitis, but that was within hours of aborting the whole thing and losing about a million quid's worth of research.

[Part 2 0:25:48] Lee: This was like a crisis, a particularly expensive crisis, or a focussing of minds. So did this now wake BAS up to ...?

Norman: So Dick then came on the phone again and said 'What are we going to do about this?' and I said 'Well (1) you have got to have a medical policy, a clear medical policy on who is going to do the medical exams, how they are going to do them, what the standards of fitness are, who is responsible.' So I was then invited to write them a medical policy. So I wrote the medical policy virtually that I had already written for the oil industry, because we had worked this out for the oil industry, and it was much the same. The standards for wintering in the Antarctic were going to be the standards of fit health for saturation divers, et cetera. That was done. I was responsible for the pre-employment medical examinations and logistics, responsible for the medicine then. So that was how it all started. Then communications was a big thing of course, because we didn't have very good communications with either the offshore oil or the Antarctic at that time. Then we got involved in the war of course, and money appeared. Things were much better. We had fax for a start and then we had computers and then we had eventually telephone. But at that time we had got it all worked out so that we were providing a very good medical service for both offshore and for BAS.

[Part 2 0:27:28] Lee: So you had doctors on rigs able to refer back to you, and doctors on base in the Antarctic able to refer back to you as well?

Norman: It was doctors on base in the Antarctic who came back. On the rigs it was largely nurses. It was rig medics, as they called them, who were specially trained and they came back and we had a belt of specialists that we could call on. So we could give them all specialist advice right away, and it was an identical sort of system, really.

[Part 2 0:28:00] Lee: This was done by voice telephone by this time, was it?

Norman: No, it was largely done by fax really, I think it was, because I don't think we had email by that time. But it was fax, and telephone. Not telephone no, fax. That's right. Fax was quite good because then you had got a record of what they have asked and what you have told them to do. And we had developed thoughts of what you do about appendicitis for example. They used to take appendices out before they sent people to the Antarctic, and I thought that was not the right thing to do basically since one of the guys died in Australia just in a routine appendicectomy. So I introduced a

concept of conservative management of appendicitis, which was what I think we used to practise when I was young. But now with antibiotics it works quite well.

[Part 2 0:29:09] Norman: We had two cases I think, of appendicitis in the Antarctic. No, three in the Antarctic in my time and two in saturation pressure chambers and we didn't operate on any of them. We treated them all conservatively and it worked. So we were introducing new forms of medicine for remote areas, and that was where the concept of remote medicine was developed. It was different, and the decisions you had to take were different. We were learning all the time, you see. For example there was a case in, I think it was Halley, not Halley I. It was when Halley was 40 miles inland, and there was a medical signal that came out, that said this chap had got a head injury, now had a depressed fracture of skull. I looked at it and I was very busy at the time 'OK, fine.' The signal had been intercepted by Port Stanley, you see, so they created a great fuss with BAS and said 'This guy has got to be got out if he has got depressed fracture of skull. So they came back to me and said 'Would you like to revise your opinion?' I thought about it a bit more and said 'No.' The third day they came back and said 'The ship is about to founder. It is your last chance.'

[Part 2 0:30:42] Norman: So I thought 'I have got to take this a bit more seriously then.' I had a visiting specialist there and I said 'Now here is a guy that they say has got depressed fracture of skull, 40 miles in from the coast, with a ship in the Antarctic, and I said "Leave him where he is." What would you do?' 'Oh you have got to get him out.' I said 'OK, let me tell you why I took that decision: (1) I know the doctor and don't think much of him. I know the X-ray apparatus; I don't think it could have been a very good picture. (3) he is conscious and with a depressed fracture of skull he is likely to be unconscious. (4) If he needs ... You have to elevate him you see. If he needs elevation, of the fragment that is in his skull, you have got a doctor there. You have got a doctor on the ship, both of which are equally qualified. The guy in the base has got all the equipment you could wish for. The guy on the ship has got pretty rudimentary stuff. Now, if we had to do this operation, he has got to be talked through it by a specialist. Would it be better to leave him, when I don't think he has got a depressed fracture of skull anyway, in a nice warm bed in a base, and if we had to do something, talk him (the doctor) through the operation there?

[Part 2 0:32:13] Norman: Or should we put him on a sledge, take him 40 miles over all sorts of rough territory, put him on a ship, take him about 6 weeks possibly to get back to Port Stanley, through the Roaring Forties and all the rest of it, and if we have to do something, do it under these circumstances?' So he said 'No, you are absolutely right. That is what you should do.' But this is the thing you see: you have got to understand the circumstances to take these decisions and it just takes a bit of time to get that sort of experience. So that was quite a good learning ... Another one I had was the bosun on the *John Biscoe*, was anchoring the ship. You dig a hole in the ice and put a thing in, and he suddenly had a heart attack. He collapsed and arrested. By that time I had decided that everyone who went to the Antarctic under the British flag would have our brand of resuscitation, of training, and we were doing that in Girton College by that time. So they managed to get him restarted and they got him back onto the ship and into the sick bay.

[Part 2 0:33:32] Norman: Then, as was this system, they phoned Cambridge and informed them what had happened, and I happened to be ... By this time I had three

consultants who shared the on-call thing if I wasn't around. So they phoned me from Cambridge and said 'We have got this problem, but you don't need to worry about it' they said. 'All I want you to do is phone his wife and tell them what has happened, because I have organised a Globemaster, or some kind of aeroplane to land on the ice and take him to New Zealand.' I said 'What do you mean? You are going to take him off this boat, put him on a thing, take him a hell of a long way to New Zealand, and then' I said, 'you are likely to unload a corpse at that end, but if you leave him exactly where he is, hook him up to an X-ray machine, and telemeter the thing to Aberdeen, and I will get a consultant cardiologist to tell us ..., to manage the case.' Because we had the relief doctor and the new doctor; we had two doctors there. That was like a coronary care unit on a ship, and we had just got a defibrillator, so we had that, and we had all the drugs under the sun.

[Part 2 0:34:53] Norman: So the guy was managed that way, basically because I had the authority to say 'Stop. Don't do that.' Then eventually the ship went back to Port Stanley. It had to go because something was broken or other, and he was seen by a cardiologist there, came back to Aberdeen, had an angioplasty and then went back to his work. So that is the basis, you see, of remote medicine. You have got have sharp end people properly trained but they have got to be managed by a senior guy 'back at the ranch'. Another case that illustrates that beautifully I think was Alastair Fraser, now in Shell. Some steward, one of the senior stewards on one of the ships, came to him with this sort of ... It was South Georgia and they were to sea. 'Now look at that wee lump I have got in my arm, Doc?' He looked at this and he didn't like the look of it because I think there was some nervous involvement. He said 'No, I don't think you should be going away down into the deep Antarctic. I think we should be getting you back to have this seen to because I think that could well be something serious.' 'No I am not ... I want to go down.'

[Part 2 0:36:19] Norman: So he went to see the captain and the captain overruled the doctor, and said 'No, it is ridiculous. Just a little lump.' So he, Alastair, quite a powerful guy in his own right, but just a very young doctor, came back to the consultant we had on call, who was a chap called, I can't remember, Alastair ... It doesn't matter, an A & E surgeon, and he said 'No. I think you are absolutely right. That doesn't sound good to me. You have got to get him out.' So he then had consultant authority to go to the captain and have this guy pulled out and he went back to Port Stanley and had a bit taken out of it there and sent back to London. I phoned the Royal Marsden Hospital where I knew somebody and said 'Could you look at this lump please?' We had that guy back, in the Royal Marsden, within a week of Alastair seeing him in South Georgia. This was a very bad sarcoma, which ... The guy is still alive. His life was saved by that thing and by very urgent management.

[Part 2 0:37:42] Lee: This was completely revolutionising the care of Fids in the Antarctic?

Norman: I think it was, yes.

[Part 2 0:37:49] Lee: And there was also I think it might be interesting to remember you ... reading about everybody being given casualty handling training at Girton as well?

Norman: Yes, yes.

[Part 2 0:37:57] Lee: So the injuries were made worse by the movement of the patient?

Norman: And you see originally, when I got the medical reports back, I was pretty horrified at some of the things they had done. Eventually, after that carry-on in Girton, they read almost like medical poetry. They were so pleased they had little bits of finesse that had been put in, in the casualty handling, where they really were handled very well. This was good, but it was only when we got to the stage of saying 'Well these skills deteriorate.' So what we then did was we trained the doctors to teach first aid, gave them the equipment and the slides and the books and this sort of thing. Then if they got enthusiastic about it they would teach the boys there and have exercises, so that they all became very proficient and able to cope. And the thing that I hadn't really quite expected when we got feedback, was that the parties who were going out into the field on their own began to say that they had much greater confidence in what they were doing when they knew that they could cope if something went wrong. They would know what to do if they fell down a crevasse and got somebody out, or something like that. That was one of the best things, I think, that came out of that training.

[Part 2 0:39:29] Lee: You said earlier that BAS had no money, so who was paying for this relationship between you and BAS?

Norman: Well, this £400 a year.

[Part 2 0:39:38] Lee: Oh, that was it?

Norman: That was it.

[Part 2 0:39:40] Lee: We are talking about the late 1960s here, '68?

Norman: Before the war.

[Part 2 0:39:45] Lee: Before the Falklands War?

Norman: Before the Falklands War, and of course that fell out in a big way with Aberdeen University because I was spending money just ... I mean there was one chap whose research equipment was going to cost £800. He came to me just before he went 'Och,' he said 'Bad.' and of course I got into serious problems, fell out with the Principal and one thing and another, but I didn't care really. I should have cared but anyway that was what happened and then, after the war, when there was a bit more money, and Maggie Thatcher produced the money and there was a big spend and so forth, I ...

[Part 2 0:40:23] Lee: Some of that was transferred to your responsibilities?

Norman: Yes.

[Part 2 0:40:27] Lee: So what major improvements took place in the mid '80s, after the Falklands War?

Norman: Well we had communications then, and we had a budget for training, and we had research money. It was at that time that I suggested that we should establish a unit. Because I had moved from Aberdeen University, where they didn't approve of what we were doing at all, to Robert Gordon's, which was very keen on things like that – a modern university type thing. Then Robert Gordon's, they were running like a business and I had the support of a very good business unit there. So I said 'How about establishing a medical unit in Aberdeen.' They of course wondered whether they could do it in Cambridge, with Addenbrookes or something in the Cambridge University. They didn't seem to want to do it.

[Part 2 0:41:32] Norman: So we established it, Dick Laws established the thing in Aberdeen. So what we had then was a Centre for Offshore Health, we called it, in RGIT⁸, and within that we incorporated the British Antarctic Survey Medical Unit. It was at that time that having been to Canada and found this tele-medicine business that was just started there, where there was a chap who was looking after the remote communities of Labrador and Newfoundland, with a bunch of nurses that he had trained and put all over the place ... And the consultants sat round the table at midday and talked to them about all the problems just once a day. I thought 'You know, that is exactly what we need.' So I came back to Aberdeen with this and I started this tele-medicine business. It was pretty rudimentary technically at that time, using slow-scan television and nobody was interested. I couldn't understand it. It was so much what we needed to do and they weren't interested. The oil company wasn't interested; BAS wasn't interested, strangely.

[Part 2 0:42:43] Norman: However I persisted with the thing, and did an experiment in transferring X-rays across the Atlantic to Newfoundland and seeing if they get the answer right. They could on most occasions. The quality wasn't very good and then digital technology came in and the quality was then perfect. So we could then really get going on the tele-medicine at that time. The first thing we did in the Antarctic was: I went down to Rothera and we were going to try and do the thing over Christmas. Christmas Day in fact it was when I did the first thing there, and we just could not get a connection. I had to think what was wrong. My colleague in Aberdeen ... they had switched off the heating (for saving money at Christmas, all they did), he was frozen and I was quite warm of course in a cabin on the *Bransfield*. Eventually we discovered the problem: we were pointing the camera⁹ at the funnel. We shifted the ship and it was perfect, but

[Part 2 0:43:52] Lee: So this was what time of ...

Norman: Winter.

[Part 2 0:43:58] Lee: What year was that though?

Norman: I know. I am just trying to think what year that was.

⁸ Robert Gordon's Institute of Technology (now Robert Gordon University, Aberdeen).

⁹ It was probably the satellite communication dish that was pointing at the funnel.

[Part 2 0:44:00] Lee: Eighties? Nineties?

Norman: It was the '80s. It was about '85, '86.

[Part 2 0:44:11] Lee: So you were getting two-way television communication between ..., visual communication?

Norman: By '86, yes.

[Part 2 0:44:18] Lee: What was this doing to the health statistics in the Antarctic? Were they improving? Fewer accidents? Fewer illnesses?

Norman: I don't know that we were involved a lot in health statistics. I think the management of what happened was much better. Everything was fine; it was good. I am not sure about the statistics of the accidents, whether that really helped, whether ... We weren't really much involved in safety education.

[Part 2 0:44:54] Lee: I mean there were other things that were improving as well. Health and Safety is one of them.

Norman: Yes.

[Part 2 0:44:59] Lee: Training, pre- ... I mean the early Fids had no training whatsoever given to them.

Norman: That's right. They were well trained, and then I introduced a kind of diploma because I thought what we were doing for them was giving them this system of training in remote health care. You had to include a bit of ??? [incomprehensible], a bit of dentistry, a bit of how to put on plasters, which was done by technicians; and that sort of thing.

[Part 2 0:44:33] Lee: So just let's expand on that. A GP was volunteering to go, or was being recruited to go South in the post- Falklands period, so there was money. Give me a little description of the kind of training they would get which they would not necessarily already have, to become a GP.

Norman: Well a GP would look at X-rays (for example) but he would not know how to take them. He wouldn't necessarily at that time know about taking ECGs. He would have been given some sort of training in medical school in giving an anaesthetic but he wouldn't really know how to use a simple anaesthetic machine that we used in these days. So he had to be instructed in anaesthetics and analgesia, and although he would know how to manage a fracture, he wouldn't know how to put on the plaster. He would know anything about nursing. In fact doctors know nothing about nursing really. So we had to give them a course in how to nurse a sick person. There was the diving of course, which they were doing quite a lot of at the time, so we had to give them a course on diving medicine. There wasn't very much knowledge about environmental medicine, about heat and cold and frostbite, all that sort of stuff.

[Part 2 0:46:58] Norman: So we had to give them that sort of thing. We had to give them about of the diseases they could pick up in the way down, the venereology type stuff of the South Americas. It was quite a big course, and we had a specialist guy to take them through the whole issue, and at the end of the day there was sufficient there to produce a Diploma in Remote Medicine. But we then were able to say 'If you do your ... ' There was the research aspect too, and if they did a dissertation, then we could convert that diploma to an MSc. So if they did a bit of research ... Not all of them wanted to be involved in research, and sometimes the research that they could do in the time they had was not sufficient to produce a good degree. So there was a bit of a problem about that. This was a good system I thought and this was RGU produced that.

[Part 2 0:48:16] Lee: Sorry?

Norman: Robert Gordon University. We were under their aegis. So I thought we then had a fundamental basis of remote medicine, because we now had a proper qualification and that would lead them on to whatever they wanted to do afterwards.

[Part 2 0:48:36] Lee: And was the progression to digital technology, was that a smooth faultless transition or was it fraught with ...?

Norman: Oh no, it was fraught with all sorts of ... Nothing was smooth.

[Part 2 0:48:47] Lee: What sort of things, what sort of problems were you having to overcome to upgrade to digital communication? Anybody who was born with a digital TV will know what it is like, but ...

Norman: Yes. It was mainly ... It wasn't so much technical as difficult to persuade people that this was a thing that they should do. Talking to the oil industry, for example, 'Oh, that means more money has to be spent.' You have got all sorts of things. You could see a hand that has to be ... Somebody has to be evacuated with a tendon injury, and drillers got terrible hand injuries. I said 'Well you can hold the hand up and you can say to the nurse "You examine the hand and I will watch you. Let me see if you can do that."' Then if you can show that it is not a tendon injury, you say 'Put a bandage on it and send him in on a routine helicopter. If it is a tendon injury, you have to evacuate them in an emergency mode and that is going to cost you £10,000.' So these were the sorts of things we had to do, to try to persuade them. I don't know that they are totally persuaded even now. But anyway that was the sort of thing.

[Part 2 0:50:10] Lee: But you were saving them £10,000. That must be some persuasion, surely?

Norman: Yes, I would have thought so. I would have thought it was obvious. BAS were a wee bit slow, too, to pick it up.

[Part 2 0:50:24] Lee: How do you mean?

Norman: Well I thought they would just automatically have introduced it, because by this time of course they had all the fancy communication technology. They could

supervise the research and all the rest of it, and all it really meant was a little bit of extra camera I think. I went away about that time to the Middle East. I don't know what they do now. They have probably got it all worked out well now, but it was a bit of a hard struggle to persuade them this was what they should do.

[Part 2 0:51:02] Lee: Dick Laws retired.

Norman: Yes.

[Part 2 0:51:05] Lee: And there was a change, I think there were a couple of changes of ...

Norman: Dick Laws retired about the time that I went away, and David Drewry came in to the scene.

[Part 2 0:51:15] Lee: And he immediately put the BASMU up for tender?

Norman: Yes.

[Part 2 0:51:20] Lee: And Aberdeen had to bid for it against competition from other organisations? And Derriford got the contract.

Norman: Yes.

[Part 2 0:51:27] Lee: I appreciate you may have moved on by then, but were you surprised by that news? Disappointed?

Norman: Yes I was. I was disappointed but I think it was ... I mean I know why it all happened really. One, there had been a case that hadn't been very well handled by one of my colleagues.

[Part 2 0:51:52] Lee: Can you give a taste of what that was, without naming names? What was the problem?

Norman: The problem really was that he hadn't followed instructions in the pre-employment medical assessment, and the guy had something that ... He should have not sent him to the Antarctic with it, but the guy was keen to go and he let him go. Then the whole thing developed into a bit of a mess there, and I kind of backed him up. But at that time there was a change in the secretaryship. You know that man that runs the administration. I forget what his name was. But a new chap¹⁰ came in and he was from the Navy and the Navy was very short of money, and I think he was quite keen to shift the thing down to the South Coast. So there was that. I had decided by that time, that I was going to do my thing in the Middle East, because I was trying to take remote medicine into the international scene. I had tried to move BASMU back from RGU into the Aberdeen University, where I thought it would be best placed at that time, considering what they had in RGU. Because they didn't have a medical unit and there was a very powerful dean in Aberdeen University who was backing all that I was trying to do, and he was prepared to take it on and look after it.

¹⁰ Frank Curry.

[Part 2 0:53:42] Norman: So there was a bit of an argument between the two universities and the then vice-chancellor in Aberdeen, by this time a new vice-chancellor, he was very keen to have it, and he knew somebody in NERC. He spoke to them and this sort of thing. So I think BAS didn't want to get involved with that, and I think they quite ... whoever this guy was (I can't remember the name) who wanted it to be shifted down south to Plymouth. Then the guy that I had left behind in BASMU; there were a couple actually there who thought I was aware they would just take it on. So they actually tried to take the thing over against the dean, Sir Graeme Catto of all people, in Aberdeen University. I think that is why it was lost. So I then shifted away and I was in the Middle East by this time and I remember being quite furious about it.

[Part 2 0:54:53] Lee: Quite furious?

Norman: Yes. Disappointed and I thought it was totally the wrong thing to do.

[Part 2 0:54:59] Lee: Did you get any sense perhaps that Aberdeen has been a bit complacent and presumed they would win the contract?

Norman: No, not really. I don't think they were complacent. I think they were just arguing about it too much. I think that was what it was. I don't know why Graeme Catto couldn't have taken it into Aberdeen University. I think there was a lot of ... I mean I don't know the details, to be honest, but I thought it was a pity that they should have lost it.

[Part 2 0:55:34] Lee: If you had stayed there longer, what would be your next thing? What would your next goal have been? What was still to be done, in the way of remote medicine in the Antarctic?

Norman: In the Antarctic?

[Part 2 0:55:45] Lee: Yes. What was still crying out to be coped with? If anything?

Norman: Well I think we had the bones of what was necessary. I think it was really just a development, further development of what we had. But I think we could quite well have developed a coterie of medical practitioners, remote medical practitioners, who could almost have been ..., become professional. Because it was a kind of new profession, now, where there are opportunities in the industrial areas, there are opportunities all over the world because people do travel and people do move now. And it is a new specialty which is really just coming into its own now, and it required educational development and it required research development, and it required the acquisition of more experience. Now I was talking to John Hall there, because I now have ... I have started a new institute, a third one (third one lucky?) about six years ago, and this one is independent this time.

[Part 2 0:57:18] Nelson: It is not being leant on by anybody, and again hasn't any money [laughs] but what we are trying to do there is improve health care for people who work in remote places with hazardous environments internationally, and promote the British form of Higher Education overseas, because we have been pushed out by

the Americans in the Middle East and places like that. That is the aim of the whole thing. Meantime, what we had established in Aberdeen in an academic way had moved away into commercial organisations because the universities had sold out their Offshore Centres, which they sold out for a lot of money in fact, because they were hard up. And so it was run by these commercial outfits and when I came back from the Middle East where I was involved in trying to do much the same thing there, I found that nothing had happened in my absence because they were only interested, these companies, in making money, and there was no development. A great deal was required in the educational scene, a great deal was required in regulation internationally. So that was what we are involved in at the present time.

[Part 2 0:58:48] Nelson: Strangely enough, there are now about four or five of these BAS doctors who have gravitated into this institute, and are part of the council of it, who got their initial interest from their work in BAS and what we did with them and how we involved them in other areas that were going on at the same time. And that is the beginning of this specialty of remote medicine, which is based on what they did in BAS really, and what we were able to do for them in interesting them and sending them to places. I sent one of them to Madagascar, this guy with the lump, he went to Madagascar and when they found there in the installation that he was then (because he was just a locum) that there was a western doctor there. Instead of evacuating people, he said they were coming out in boats to consult them. Another one went to ... Mobil had a blow-out in Indonesia and another of these guys who managed to stop his write-up time at BAS, he went out and helped them and he advanced experience there. A third one went to Oman.

[Part 2 1:00:09] Nelson: So these chaps all were people to develop big careers. I mean one of them, this Fraser guy, he is now the head doctor of Shell, just recently established. Now what I was talking to John Ross about was that Shell have decided to explore Western Greenland in a big way because there is apparently a lot of oil around it, and Alastair Fraser came to see me about this and he said 'You know, we can't evacuate them with helicopters as we do in the North Sea because you can't get out of there for two or three days'. So what we have got to do is elevate the experience and the knowledge of the medics that we put in there, and relate to a bank of consultants that I'll have employed with our technology, so that we can have a high grade of medical care for these people.' In other words what we have done all these years ago with BAS, only now very fancy facilities.

[Part 2 1:01:21] Lee: Is there anything that you pioneered in your years, that you feel an organisation like NASA have borrowed. We have got men in very remote locations haven't we, or we had in the 70s, and we still have now in the space station.

Norman: That's where I got the idea of the tele-medicine from, because I went over to ... I just happened to be at some conference or other, where I met a chap who said he had seen this thing in Cape Canaveral, I think it was, and I would like to go and have a look at it. I went down to Cape Canaveral where I think they were closing it down at that time. They were trying to use the technology that they had developed to look after astronauts and they had this system that they had put in to some Indian reservation or other. I was fascinated with what it could do, That was really the technology of tele-medicine. So I picked that up and went back and talked to the Newfoundlanders who

were beginning to develop it too, and it just seemed like the answer. It came from NASA really.

[Part 2 1:02:34] Lee: Were you surprised about the Polar Medal?

Norman: My Polar Medal? I was delighted about the Polar Medal.

[Part 2 1:02:42] Lee: Was it for the medical work?

Norman: Yes, it was based on the medical work and the penguin thing as well to a certain extent and honoured a lifetime of involvement in it. No, I was absolutely delighted with the Polar Medal.

[Part 2 1:03:05] Lee: We must leave it there, but Nelson, it has been very interesting. Thank you very much indeed.

Norman: Thank you. It has been interesting talking.

[Part 2 1:03:13] [End of Part Two]

ENDS

Possible extracts:

- Falkland Islands Dependencies 'off South America'? [Part 1 0:06:24]
- Sir Raymond Priestley and the penguin embryo project. [Part 1 0:09:19]
- Appreciation of Anne Todd. [Part 1 0:11:00]
- Vinegar and caraway seeds. [Part 1 0:12:38]
- A breakthrough in cold adaptation research. [Part 1 0:23:03]
- Sir Vivian Fuchs' reaction. [Part 1 0:26:17]
- Warmth of the hut and food at Halley Bay. [Part 1 0:30:28]
- Curing a nose bleed with a tractor heating plug. [Part 1 0:35:01]
- Depression on base. [Part 1 0:36:41]
- The penguin project. [Part 1 0:43:01]
- Dissecting the penguin egg and embryo. [Part 1 0:47:56]
- A scary moment at the ice cliff edge. [Part 1 0:53:10]
- Effect of technology on Antarctic research. [Part 1 0:55:16]
- Origins of the BAS Medical Unit. [Part 2 0:15:46]
- Only £400 for four research projects . [Part 2 0:17:24]
- A couple of medical crises at Halley. [Part 2 0:22:07]
- Appendicitis in the Antarctic. [Part 2 0:28:00]
- The role of tele-medicine. [Part 2 0:41:32]
- Training doctors for the Antarctic. [Part 2 0:44:33]
- BASMU leaves Aberdeen for Plymouth (Derriford). [Part 2 0:51:05]