ANDY CLARKE

Edited transcript of a recording of Andy Clarke interviewed by Chris Eldon Lee on the 17th October 2012. BAS Archives AD6/24/1/188. Transcribed by Andy Smith, 17 January 2017.

Part One

[Part 1 0:00:00] Lee: This is Andy Clarke, interviewed by Chris Eldon Lee, on the 17th of October 2012. Andy Clarke, Part 1.

Clarke: Andy Clarke, London (North London) 27th of January 1949. I actually grew up in Islington before it became the 'People's Republic of Islington'.

[Part 1 0:00:22] Lee: So you are now how old?

Clarke: Oh dear, what a calculation. That makes me 63. I do actually have to make the calculation.

[Part 1 0:00:31] Lee: Tell me about your parents.

Clarke: Oh that's an interesting question. My parents were an unusual mix for the time. My father was one of five children and born in East London, Leytonstone area, brought up there. He trained in local government. As with so many of that generation, that training was cut short when he was deployed during the war. He was in radar during the war, radar operator. Although he didn't see action, he travelled a lot particularly in the Middle East and North Africa and Malta, and that's where I think he picked up something that stayed with him for the rest of his life, which was a love of deserts, and that somehow has made it through. It can't be in the genes, but somehow it has made it through to me because I like hot deserts almost as much as I like cold deserts.

[Part 1 0:01:24] Clarke: My mother was very different. She was born in Dublin. She was extravert, Irish, a Catholic. My father's family was not and at that time a mixed marriage was not very common but the problem was solved, if I can put it that way, when my mother's father was killed by the V2 that demolished Smithfield Market. My mother was in the RAF during the war. She was a fitter on Hurricane and Spitfire aircraft, had the time of her life during the war and had many good stories to tell about it. Sadly neither of them are alive at the moment. And after my father retired from local government in Islington, they moved to North Norfolk, a very isolated village in North Norfolk, Happisburgh, one that always appears on news bulletins when they are looking at coastal erosion. And they are in the churchyard at Happisburgh church now.

[Part 1 0:02:15] Lee: So you were brought up in Norfolk, then?

Clarke: No, I was brought up in London. It was after my father's retirement that we moved. I am essentially a Londoner, or am a Londoner, and it is a moot point whether I'm North London or East London. We grew up within the sound of the Arsenal football stadium. My father was a season ticket holder when he gave up playing. He

was a very good amateur footballer but had to give up at the age of forty because of an ankle injury. He took out a season ticket at Arsenal and my two younger brothers were and remain fanatical Arsenal supporters, and I decided that I was going to go somewhere else, so I went to West Ham and so I often say I am actually an East Londoner. The truth is I am on the boundary between … We were born on the boundary between East London and by the strict definition of the sound Bow Bells, I am about 500 metres from being a proper Cockney.

[Part 1 0:03:03] Lee: Do you ever wonder whether you backed the right team?

Clarke: Yes, frequently. There are many choices you make in life which have no rational basis whatsoever, and supporting a football club or any sports team is actually an emotional decision. It's an emotional thing, not a rational thing. By any rational thing, we would all support Manchester United. I don't.

[Part 1 0:03:22] Lee: Neither do I. Where did your interest in biology come from?

Clarke: A question I am often asked and I don't fully know. What I can say is that I know that I had a very unusual and inspirational zoology master as a schoolchild. Because my mother was a Catholic, I went to a Jesuit school. It was not all Jesuit teaching; it was mixed. There were lay teachers there as well, but interestingly, the two most influential teachers were: one was Jesuit priest who was a physics teacher who had moved away from being a research physicist to enter the ministry. I am not sure if ministry is the right word for the Catholics. And the other was a lay teacher of zoology who was a Polish gentleman, taught in the old fashioned way where you learned things by rote, but he gave us some freedom and his approach was interesting.

[Part 1 0:04:17] Clarke: I remember that as being part of my education. Whether that was the reason, I can't put my finger on. It's something I have actually been musing on recently because since we moved, I retired and we moved up to Norfolk. One of the reasons for moving to Norfolk is: I am a keen birder and Norfolk is probably the best location in the country for all-round birding. And in retirement I have started to look back through my old birding records and my first birding notebook was written when I was 12 and it records a day out in Norfolk. So whatever it was, started early but I can never put my finger on it. But it was encouraged by my parents. Once they realised I was interested in zoology and particularly keen on birding, my father bought me a pair of binoculars for a Christmas present and it went from there. It's one of these things I suspect just evolved gradually and was supported, rather than there being a seminal Road to Damascus moment at some stage in my career. I think it was just something that emerged, strange seeing as I was living in the centre of a city.

[Part 1 0:05:16] Lee: Where do you think your first awareness that there might be a place on this planet called the Antarctic … When would that have happened?

Clarke: I don't know. My parents were very keen on education, so we had a lot of encyclopaedias and atlases around. So I knew of Antarctica way way back but exactly when I first learned about it, I don't know. It was part of my general education. I probably became aware of it at the same time as I became aware of where places like Afghanistan or India were because obviously there are points in your upbringing

when we don't know those things and then gradually, as part of education, you learn where these things are.

[Part 1 0:05:35] Lee: Would the family have owned a globe?

Clarke: We did actually, yes. We owned a globe and it was one that you could buy, I think, from … well they didn't have Sunday colour supplements in those days but that sort of thing. You bought it through an advertisement and I remember vividly because it had a bulb inside it, so it illuminated, so you could light it from inside, and it was a political map rather than a physical globe. It showed the political boundaries and, as was the notion at the time, large bits of it were coloured pink or whatever.

[Part 1 0:06:25] Lee: So the bit of course at the bottom of the globe, would have been white wouldn't it, not pink?

Clarke: Yes, it was and I didn't think anything of it. My interest in polar regions didn't really start until I experienced them as an undergraduate.

[Part 1 0:06:41] Lee: Well there is a reference in some of your notes here, to a grainy photograph of South Georgia.

Clarke: Ah yes, yes. My parents, as I mentioned, were keen on education and another part of an answer to the question we have already tackled, which I didn't give then, is that I was given a lot of freedom as a child. I was the eldest surviving child. In those days not all children survived and I was the oldest surviving child and I was given a remarkable amount of freedom. I used to spend a large amount of my time in the school holidays in the Natural History Museum. That was the other side of London, but it so happened that the Number 30 bus would run from outside my door, virtually, to outside the Natural History Museum, so it was a single bus ride. A long one but my parents were obviously happy for me to do that and I spent a lot of time there.

[Part 1 0:07:40] Clarke: They also allowed me to … I used to wander up the Holloway Road (as it still is) which was where the Islington public library was and they had a children's section in there and I used to wander out of the children's section into the adults' section. And the book in question was actually the Duke of Edinburgh's book on *Birds from Britannia* which is a series of very grainy photographs taken on his visit to the Antarctic. And one of the photographs he took, I now know, was actually in Cumberland Bay in South Georgia, and it was obviously a very dark and stormy day and it is a very evocative photograph of a part of Cumberland Bay that I now well recognise. But at the time it was just an extremely evocative photograph of a place that I thought would … was the sort of place that nobody ever got, and even if you got there, you wouldn't necessarily be sure you wanted to be there. It looked that bleak and forbidding, but as luck would have it I ended up there, so …

[Part 1 0:08:33] Lee: That photograph stayed in your memory obviously?

Clarke: Yes. It wasn't the reason I went but the photograph stayed in my memory. In fact it is the only photograph in the book that I could probably recall now. Many of

the photographs in there wouldn't pass muster now with modern equipment, the ability to capture images of seabirds et cetera now, but that one remains with me.

[Part 1 0:08:52] Lee: You chose biology as your university degree, which was at Cambridge?

Clarke: Yes. That was something … Like many of my generation, I was the first of my family to go to university and my parents obviously, without pushing in any way at all, obviously had aspirations. I had no idea whether I was good, bad, or indifferent but they suggested I apply for Cambridge. I did, I got in, and the college was effectively chosen for me, in that my father took advice and his boss, or someone he worked with at the Islington Borough Council, was a graduate of Corpus Christi and recommended the college. It turned out to be a very good college to be at. It had its idiosyncrasies. It's not strong in all areas but it turned out to be a very good location for me and I had a fine three years. I thoroughly enjoyed my undergraduate career there, and by then I was fairly fixed on doing biology but in the Cambridge system at the time, you didn't specialise until your third year. You do a Natural Sciences degree and so in the first two years, the options were biology but you had to do other subjects. There was a minimum number of modules we would call it now, courses at the time, that you had to do. And I had to find another one.

[Part 1 0:10:06] Clarke: So in my first year I did the two mandatory biology courses, both of which were new that year – they were experimental – and I decided I would do geology. And I got totally hooked; I thought geology was tremendous. So in my second year I did the one mandatory biology, I did geology and then I did Philosophy of Science as an add-on which was optional at that stage. You could only do two if you wished. The Philosophy of Science sounded interesting, so I did that. Come the end of two years, I had to make a decision as to whether I stayed with biology or whether I actually followed geology, which had really captured me. In the end it was a very close thing and I stayed with biology. Sometimes I think I tossed a coin. I didn't physically do that but it was mentally that. It was a very close-run thing, but in the end I stayed with it and as much as any reason, it was because in my second year we had a very charismatic lecturer who showed me what zoology could be like. Whereas in the first year, the organismal biology, as we would call it now, was taught in a very stulted old-fashioned, dry and exceedingly boring manner and I also blame that first year course for the fact that only now have I got interested in plants, in my sixties.

[Part 1 0:11:21] Lee: So do you want to name that inspirational …?

Clarke: Yes, he was Martin Wells, great grandson of H.G. Sadly he died a few years ago but he wrote a little book called *Lower Animals*, which I still have on my bookshelf and what was fascinating about it was that the traditional way of teaching animals was you started at the lower end as the old fashioned approach, from amoeba to Man effectively, and you worked up from single cells through insects and what were then called the lower animals, up to the higher animals, the vertebrates. It's the wrong way of looking at animals but that's the way it was treated, and you just slogged through them group by group. Martin's approach was to throw all of that out and say 'Well when an animal gets from A to B, it has to move. This is how animals

move. This group of animals do it this way, this group of animals do it that way, this group of animals do it this way.'

[Part 1 0:12:11] Clarke: 'The common problem is: you have got to get from A to B and there are lots of ways of doing it. If they want to know where they are, they have to be able to sense their surroundings. This is how insects sense their surroundings. This is how worms do it. You might not think they do it but they do it this way.' So essentially I suppose he took a horizontal rather than a vertical look, or a vertical rather than a horizontal, and it was my first introduction to what these days we would call comparative biology, and I had never thought of animals in that way. It was an enlightening moment, delivered by a very charismatic lecturer. He was a tremendous lecturer to listen to, and it sold me that there actually was something interesting in comparative biology and that's the approach I have had all my professional career, is comparative.

[Part 1 0:12:57] Lee: You joined BAS straight away from university, as a graduate, so what happened? What was the process? When did you start thinking that going South was a good idea?

Clarke: Well it goes back to an experience halfway through of my undergraduate career. In those days the traditional thing was that the Long Vac enabled you to travel. And so in the Long Vac between school and university, I went off to Central Anatolia. In those days, that was a long way from anywhere. There are package holidays there now. My parents were aghast I think because the first time I had gone abroad and I ended up in Asia. But the Long Vac after that, I found a little note on the Geology noticeboard that said 'Would anyone like to go to Spitzbergen?' The Cambridge Spitzbergen Expedition which was a geology expedition under the guidance of Bill Harland who was a stalwart of polar research in the Arctic. They took undergraduates, basically, as field assistants.

[Part 1 0:13:54] Clarke: You had to pay for it and I had to go and knock on my Dad's door and say 'Any chance of 50 quid?' which was actually a lot of money in those days, 'because I would like to go to Svalbard.' And they did. They paid up and off I went. That was my first experience of polar regions and I was absolutely enthralled. I loved every moment of it up there. It was interesting and tough. We were under canvas all the time. We had a few little harum scarum moments but it was fine. I came away convinced that that was great but I thought that was going to be my only experience and that I would go on and do something else. In your last year you were looking for PhDs and I was anticipating that I would be able to get a degree that would enable me to do a PhD.

[Part 1 0:14:37] Clarke: I fancied doing it and of course the job market was very different then. It was a question of 'Which one of these various ones should I go for?' rather than 'Will I be able to find a job?' While I was looking around I applied for one in Western Ontario to work on cardinal birds. I looked at one to work on geese in Canada, and there was an advertisement for a biologist to work on krill in the Antarctic. I thought 'That sounds interesting. I will go for that.' I didn't tell anyone I was going for it, particularly my then girlfriend who I don't think was overly impressed when I announced I was thinking of going to the Antarctic for two and a

half years. I just didn't think in those terms then. It sounded like a good job. I would go for it, so I did.

[Part 1 0:15:18] Lee: How did your parents react, to our Andrew going off for that length of time?

Clarke: They were very supportive. I don't know what they felt internally. Mother being a mother, I am sure was concerned that her eldest son was going to disappear for two and a half years but there must be something in the upbringing because my younger brother decamped to Africa where he still is, and my middle brother is now in France. So once they retired, family reunions were rare events. Much enjoyed by my mother when they were there and the three sons made sure that on occasions we did all get there together with our partners and things. So those were good events but I think she was secretly proud of the fact that her children went off and did interesting things. For the generation that we were, we did really quite interesting things. Nowadays the ability to travel and the opportunities for those things are very much wider than they are now.

[Part 1 0:16:15] Lee: What do you remember of the BAS interview?

Clarke: Surprisingly little actually. I don't remember that much of the interview. It was Bill Sloman who did the interview if I remember rightly. I think Ted Clapp was there and then Dick Laws was the primary interviewer. My only feedback from it was to chat to Dick once I was appointed, at Monkswood and preparing to go. And of course I was a very junior member of staff and Dick, as anyone who met him will know, is a very imposing figure. He came and sat down beside me and we got talking and then he asked me how I found the interview. I said I thought it was OK. 'I think I managed to get most things across.' He said … Dick's reply was 'Yes, Andy. The problem we have with most people is getting them to open up. The problem we had with you was getting you to shut up.' So that's the feedback, so I think I was nervous. Well I know I was nervous and I talk a lot when I am nervous, so that was obviously it.

[Part 1 0:17:11] Clarke: What I do remember more vividly is the medical that followed, because (I didn't know at the time but) they have an initial assessment, yes or no, a possible candidate or definitely not, and they only medical the ones that they think are at least a possibility. I was dispatched round the corner, if I remember rightly, to a medical from one Surgeon-Colonel Hayward who was a very tall imposing gentleman, ferocious eyebrows that met in the middle, made Denis Healey look small, and gave me an interview, and very subtle. I remember the medical very vividly. It was only afterwards I realised the subtle way he carried it out. For example he would stand across the room and bellow at me 'I am just testing your hearing now. Seems fine to me.' I thought 'Of course I can hear that. He is bellowing at me.' But it was only afterwards I realised that he had asked me to view the eye chart very quietly. So he had actually tested my hearing by asking me to watch the eye chart, and the rest of the interview was done like that. It was done in a kind of oblique and subtle way, and he was a military gentleman, so he obviously knew about dealing with people and it was only on reflection afterwards that I realised what a subtle and interesting job he had done.

[Part 1 0:18:28] Lee: So were you being psyched out?

Clarke: No but I learned afterwards that they did ask Surgeon-Colonel Hayward for his comments on psychological suitability. At no stage in our history, that I am aware of, did we ever use psychometric testing[1], which of course is famously …

[Part 1 0:18:46] Lee: Most Fids think, when you ask them, they think about it, they had actually been asked searching questions at the interview about how they got on with other people and …

Clarke: Yes, I was asked in my experience of interviewing at BAS, which lasted some 20-odd years … Yes, you do have some standard questions, or standard approach. It would be wrong to say I had a standard question, but there are some routine things that you do explore.

[Part 1 0:19:12] Lee: So you were sussing out candidates psychologically as well, were you, later on?

Clarke: Yes. People often ask you how you do it and actually it is quite straightforward. I interviewed mostly for biological posts. Sometimes I would sit in on the Diving or Boatman but that was not usual. So it was mainly for technical jobs and in interviewing people, you are making two assessments, effectively, in parallel. You have to decide whether the person can actually do the job that is there. Are they good enough to do the diving in the Antarctic? Do they have the qualifications and the technique? Are they suitable to be the boatman? Is this person a good biologist or not? That is the technical assessment. At the same time, in a non-formal manner, you are also deciding whether or not they would be suitable for the Antarctic and the way you approach it is basically to ask yourself 'Could I live alongside that person?'

[Part 1 0:20:01] Clarke: That's the question I ask myself, and it wasn't my job, as the technical part of the interview. It's usually the Establishments, or personnel section, who would ask the questions about exploring what they are like in a community environment, and he usually explored things like 'Have you lived in a communal house?' 'How did you organise the cleaning of that?' Those questions, you usually expose the sort of approaches that people have because obviously you are living in a common environment down there. It's a mucking in system; there's a rota system for cleaning and sorting things out, and you need to know that the person will be able to adapt to that. Much more interesting, here is one of the stories that … I wouldn't name names in this particular case but I will give you a … In the latter stages, David Walton and I, when we had a position of managerial influence, the day I was appointed to run Marine Life Sciences, David was already running Botany, or Terrestrial Life Sciences. David called me and said 'Now there are two of us, we can perhaps get something done.'

[Part 1 0:21:08] Clarke: The number of biologists on the Board (or the Director's Committee as it then was) has gone up. Let's go off to the pub and see what we can sort out. Is there is anything as a combined force that we can do.' It took us two

[1] There was a study by BASMU, see Grant et al. (2007), on whether adding a Selection of Antarctic Personnel (SOAP) test would improve the recruitment process.

seconds to decide what we were going to do, and that was: we had to break the glass ceiling and get women into the Antarctic. And that was our challenge. We gave ourselves five years and we did it in two and we did it in parallel. David was absolutely instrumental in it because he sat on all the various committees that wrote the reports and everything else. He jokes that my approach was practical. I simply appointed loads of women. They argue I was positively discriminating. I argue I was appointing the best people on the day. But of course introducing women into what had previously been an all-male environment is a major step. Not all the people who were down there at the time, or who viewed BAS as a career or whatever, were overly happy with it. There were some people who didn't appreciate the change. I think it has been an unqualified success personally but there were some difficult steps to come over psychologically, and there was also the question about how we introduced those first women into the system and that led to the most memorable interview answer I have ever had.

[Part 1 0:22:22] Clarke: We were interviewing a student, and this was an extra complication because we had started to set up relationships with universities and of course it is the university that appoints the student. So I went to Richard Hanson, who was the personnel officer at the time and said 'Richard, we have got a procedural problem here. The university have appointed the student and the plan is for them to go South, but this is someone we have not interviewed in any way. How do we deal with this?' We resolved it by saying 'We will agree that the studentship will go ahead. We have got plenty of material that she can work on (it was a she) in this country, but just say that the fieldwork element is just subject to a brief informal interview at BAS.' So he authorised that. I said 'That's fine, Richard. That will work. Now we have got that clear, I should tell you that this person is blonde and drop-dead gorgeous, Richard.' So he brought her in. I can't remember her name. He brought her in and Richard's face virtually hit the floor I think when she came in.

[Part 1 0:23:21] Clarke: Anyway the interview went well. She was vivacious, outgoing, very smart, did some nice science and could clearly do the job. So Richard just started to explore some of the more potentially problematic areas. He said 'You must realise Karen that you are one of the first women that we will be taking to what was previously an all-male environment.' Karen said 'Yes and about time too!' Richard said 'Well I just need to explore a few things. Do you mind if I ask you: have you ever been the victim of unwanted sexual advances?' Karen said 'Oh yes, plenty of times.' Richard said 'What did you do?' 'I tell them to fuck off.' And at that moment it was the best answer she could have had and we just fell about laughing. It turned out that that was also pretty well an indication of the way she dealt with life in general. But it is still one of the best answers I think I have had: straight, direct and to the point.

[Part 1 0:24:15] Lee: Was she appointed?

Clarke: She was yes.

[Part 1 0:24:18] Lee: To go South?

Clarke: She caused a few waves but she did the job. She came away. Yes.

[Part 1 0:24:23] Lee: Apart from the history of no women ever going South with BAS, what were the huge barriers that you and David Walton had to climb to get that first woman to go South?

Clarke: It's a very sensible question and it is actually not an easy one to answer. I would say probably entrenched old-fashioned attitudes in a small number of managerial staff that we had to persuade this was a necessary step.

[Part 1 0:24:54] Lee: Would they be military types?

Clarke: Often, yes. Would it be? Sometimes, but not always. I would say more of an old-fashioned approach to life. In the end those objections were effectively overridden by a majority vote. We never had a formal vote but the world moved on inexorably. But there were some difficulties. An example: the first station we took women to was Signy. These weren't the first women through BAS to the Antarctic at all but the first formal place where we had them first doing summers and then wintering was Signy Island. Signy was a small old-fashioned base and it was fascinating because the standard objections were advanced. 'There are no facilities for them.' 'OK, let's build some. We do have builders. We can build things.' So they constructed a small Portacabin which would have two women's toilets in, and for some reason that I never understood, this was actually delivered to the ship already plumbed in so it weighed an absolute ton and everything that comes ashore at Signy is carried by hand. The plan was that this would go ashore, up the ramp, through the station, round the back and be parked at the back side of the station.

[Part 1 0:26:26] Clarke: Well it took four scaffolding poles and four people on each scaffolding pole to lift this. We were carrying it up the ramp and it became clear within a foot that there was no way this was going round the back. It was physically impossible to get it round there, so it was eventually manoeuvred up to the front of the station and placed by the door where it just so happened that the muck pipe ran out. So it was plumbed directly into the muck pipe and sat there. It was never ever used. What happened was that there was already a system in place, the urinal. There was a urinal; that was partitioned off, out of courtesy, but there were two cubicles and two showers. And the showers again had been partitioned off previously anyway and a system simply evolved which was that if the shower was occupied, you shouted and if it was the voice of the same sex that replied, you went in. If it was the voice of a different sex, you waited outside, and the problem was solved within minutes. The base evolved its own solution to the problem. So none of those practical problems that were often raised were ever a problem in reality on the ground.

[Part 1 0:27:41] Lee: Did you ever come across gender problems in the field, two in a tent?

Clarke: No, I was not a field person in that sense. My work was based almost exclusively on the station, so almost everything I did was based from a laboratory on the station and the field work I did was small boat work.

[Part 1 0:27:58] Lee: And was there any way of talking to these women when they got back, to say 'How was it for you?' Was that something you did?

Clarke: I didn't do. People did but my approach was simply to socialise with them and get a feel because I was responsible for not all but many of the early appointments so I felt a moral and managerial responsibility for them, to make sure that life was OK. And so I would talk to them and mostly they came through it OK. I think some of them found it tough but we told them beforehand that it was potentially tough, and we would have … There might be problems to solve on the way. There were a few problems to solve on the way but I always say, and in retrospect I wouldn't change my view, there were emotional problems on all-male bases. There were emotional problems and inter-personal problems on mixed bases. You simply changed the nature of the problem. They weren't any worse or any better but overall the social environment was greatly improved in my opinion.

[Part 1 0:29:00] Lee: Less rugby club?

Clarke: Yes. Less farting at dinner for example, simple things. It was that sort of thing. The social atmosphere improved, pornography disappeared. It went underground; it didn't disappear, out of courtesy, and I think overall the social environment was better and the science environment was significantly improved because you are recruiting from the whole population not just half of it. And BAS benefitted enormously by the first crop of people we sent through generally being very smart, very hard-working and very good. So they carved a career.

[Part 1 0:29:38] Lee: Well they had a point to prove hadn't they, I guess? They had an extra burden didn't they?

Clarke: They did. It would be wrong to say it wasn't tough for those early ones. To deny that would be silly. It was tough but they knew, at least in theory, what they were doing and the environment they were letting themselves in for and they all handled it very very well. I think we have had some very very smart women scientists through.

[Part 1 0:30:07] Lee: Did any of the entrenched individuals come up to you later on say 'I'm sorry. You were right?'

Clarke: No. I think it is like many such things, it required the generation to pass on, by retiring, and I think there was a general recognition that this was a necessary step. It was necessary in lots of ways, not just legally apart from anything else. It was a necessary step to come to terms with modern times and I think there was a recognition that that was so and there was a recognition that we had made the step and it had not been accompanied by the collapse of Western civilisation which was sometimes suggested it might be. But then people don't do that.

[Part 1 0:30:48] Lee: Let's flip back. You are sailing South in 1970 for South Georgia to work on krill. Did the krill cooperate?

Clarke: No they didn't. The plan was that we … Let me rephrase that. The original job description and idea for the project was that we would establish a marine biology station at South Georgia. probably at least initially in the old Discovery Investigations building which was nice because that's where marine biology history at South Georgia had taken place. And that we would use that as a base, use small boats and

scuba diving and use those as ways of collecting the animals. That would have worked if the animals had been there but it turned out that, for reasons that we don't yet fully understand, there had been a shift in the availability of krill. It is now apparent that that may be part of a long-term shift in populations but we don't really have the data to be sure. But what we do know is that in the days when the Discovery Investigations were active, krill were a lot more available close to shore at that site than they proved to be when we tried to repeat some of the work, or develop and build on the work. So I was there with my supervisor who was Inigo Everson and the two of us built an aquarium, built a lab. The dry lab was, turns out, was in exactly the same place as the Discovery Investigations dry lab which was kind of nice. And then set about sampling but it became clear very quickly that this was going to be a much more difficult job than we had anticipated and before Inigo left to go home at the end of the summer, and I was to stay for the winter, he and I talked about the possibility that we might have to change the project.

[Part 1 0:32:40] Lee: Before you talk about what you did do, what were you hoping to find out about krill? Was it ever discovered?

Clarke: We didn't have a formal plan in the sense that we would look for X and Y. It was more a question of building on the Discovery Investigations work which was extremely thorough, looking at growth rates and in particular I think Inigo was interested in exploring the biochemistry of krill, which is something that had only been looked at in a fairly simple way before and that was an area also where techniques had moved on enormously since the Discovery Investigations days. Ways of measuring growth rates and population size hadn't really changed, but what had changed was biochemistry and our understanding of physiology. Inigo came down with the idea of starting that and I took that on board, effectively self-trained because the equipment was there and there was a book there and I had to learn. We took it from there. I guess this is another thing that has changed now, not just in BAS, in science in general.

[Part 1 0:33:44] Clarke: This is a slight aside but it is to illustrate the point. I had dinner recently with my wife's old boss, who was a world expert on spiders. He is now 90, still very active, lives nearby. We went to lunch with him and I started asking him about his career and his PhD. It was at Oxford and he had been to see his supervisor on his first day. He was a very famous ecologist called Charles Elton and apparently Elton said 'Well, young man, I think you should go out into the local woods. Have a look and see what you can see, and come back and tell me if anything catches your eye.' And apparently, the student went out, came back and said 'Well there seem to be an awful lot of spiders there.' 'That's fine boy yes. Find something to do with spiders.' And that was the approach, much more open ended. Nowadays the approach is 'We have a grant to do this very specific piece of research and we are expecting the answer to be something like this.' Research has become very much more channelled and prescriptive. It is part of a general change in science.

[Part 1 0:34:45] Lee: But in your day, it was almost like a blank canvas? So little was known, particularly about the Antarctic, that you could choose almost any subject, and nobody had done it. Today science has already been done in so many fields so you have got to be more selective about the work you do, the effectiveness of the work you do, discovering new things?

Clarke: Yes. There is an element of that. It is less of a blank canvas now than it was but even so there are plenty of areas that we could explore, and actually we carried the old-fashioned idea forward for as long as we were allowed to effectively, in that as I moved through the system, and then started having students of my own, or supervising other people, and setting up a research programme at Signy, I took the old-fashioned approach which is 'Well, let's ask a general question and then leave it up to the student to find something more specific.' But have plenty of interactions to make sure that student doesn't go off the rails. Not everybody responds well to an open-ended … I was talking to Inigo only the other day about one of the students, or one of the biologists we employed, who effectively delivered nothing. That wouldn't be possible now. The new system has its benefits, in that you keep a much closer eye on students and if they are not delivering, then either you change what they do or you change the supervisory regime, or you ask them to move on. It's a very much more focussed and structured existence now than it was.

[Part 1 0:36:16] Lee: You had one or two problems with your research, particularly trying to bring samples back to the UK?

Clarke: Oh yes. That story, yes. Well Inigo and I had largely come to the joint conclusion that work on krill was probably not going to be possible but the final decision, if I remember rightly, was in the end left to me and Inigo had returned to the UK I think. In those days, communication was telex so I think I sent a 100-word telex back or something, to Inigo and Dick Laws, saying 'Can't work on krill; have decided to do this.' And I proposed an alternative project, which to be fair, Inigo and I had talked about in outline beforehand, so it wasn't totally out of the blue. We'd had a discussion along the lines of: if you decide to drop the krill, this might be an interesting animal to look at. That's what I did but after that it was left to me, and part of that work involved bringing a large number of samples back because I decided I was interested in chemistry and physiology, and working in the Antarctic sets you a problem with technical apparatus. It's a question of 'Do you take the apparatus to the animal or do you take the animal to the apparatus?' And in those days, the sort of equipment I needed to answer the questions I was interested in didn't travel so I had to bring the animals back and I brought them back frozen.

[Part 1 0:37:35] Clarke: So myself and Mike Richardson (who was bringing some material back from Signy) and some of the doctors who were bringing medical samples back, there was a whole range of samples, but mine was probably the bulkiest, were brought back in the freezer. That freezer was in the lab on the back of *Bransfield* and of course as it comes through the tropics, the freezer is working hard because there was no air conditioning of any consequence in the back labs. It was reaching 30 Celsius in there, and the freezer was working overtime to keep the samples at −20 which was the threshold temperature that we needed. But a freezer is also a very good way of cooling beer and so we used to check the freezers twice a day and it became apparent that beer cans were being slung in there, or softies and other things in there. So we said 'Look, ….' We stuck a notice on the door saying 'These are valuable samples. They will be damaged if you keep opening …' Please can you not use those fridges for those reasons, for cooling beer. And the next night we were back and there was more beer in there, and the notice had been ripped off. So OK, it is clearly something happening on the night shift, so what we will do, we put a small

lock on the fridge and we locked the door to the lab. In those days, nowhere in the Antarctic was locked, no room was locked. I think the only thing that would be locked would maybe the firearms cabinet, because we still had them in those days.

[Part 1 0:38:57] Clarke: Everything else was left open. The medical area would have been locked as well. And when we got there next morning, the door was open. We went in; the freezer was empty. So we went upstairs to the Mate and said 'Did you move the samples during the night?' He said 'No, we didn't move any samples during the night.' It was one of these things where recognition as to what has happened slowly dawned. So we went down again. I think we had a close look at the lab, saw that actually what had happened was that the door had been levered open with a crowbar, and the fridge had been levered open with a crowbar and the entire contents of the fridge had been emptied over the side. That story is well-known and people remember it. What isn't so well known is actually that the people who did it actually tried to get in the side door and they had broken another door in. And that turned out to be the locker for the outboard engines for the RIBs and I think it was four outboard engines were also thrown over the side, which was a non-trivial loss for the ship.

[Part 1 0:40:01] Clarke: Had they needed to rescue someone, for example, who had fallen over the side of the ship, that would no longer have been possible. So that was not a simple or easy thing. It was quite a serious thing to have lost. Being on a ship is a small community. Everybody knew who had done it. Clearly it wasn't the deck crew because they would have known where the outboard motors were. It pointed to the engine room and, as happens in a small community, everybody knew who had done it, but in the end, the police were involved and there was virtually no evidence other than a minor amount of forensic evidence. My understanding is that it was decided not to prosecute because there was no possibility of a conviction, given the evidence and the people were denying it. So nothing ever happened over it. Although he rumour is that the two individuals concerned were blacklisted in terms of the Merchant Navy and never got a job again, which people nod and say 'Quite right too.' But actually it's not quite right because they were never convicted of anything and so you are damning someone's career on the basis of supposition. But that is the way the world works sometimes.

[Part 1 0:41:10] Lee: Did you ever establish a motive?

Clarke: Yes, simply, well our understanding is that the individuals concerned were under the influence of alcohol at the time and just were a bit annoyed to find out that they couldn't get in to cool their beer, and then just …

[Part 1 0:41:24] Lee: They had no concept of what they were destroying?

Clarke: Absolutely none, no. Absolutely none. The other thing that I remember vividly from that particular incident was that I'd travelled down on *John Biscoe* with the newly appointed Second Officer who was Stuart Lawrence. On the way back, Stuart had risen to be Master of the *Bransfield*. So he was the Master in charge of the ship, hence responsible for anything that happened and he was distraught. He was really … He was more upset than either Mike or I were. We just sort of said 'Oh well …' We had an attitude: 'There's no point in crying over spilled milk.' We swore. We got drunk in the bar that night probably, but Stuart felt that this was a slight on his

ship and everyone else and he was more upset I think than either Mike or I were at the time. I haven't seen Stuart for a while but whenever we see each other, we look back on it on occasions and remember. We can look back on it and laugh now but at the time it was not funny.

[Part 1 0:42:19] Lee: So, apart from going to the bar, were you angry?

Clarke: Surprisingly, no. I recall being annoyed and recall also wondering what it would do to my PhD, because having changed projects, not in midstream but early on in the stay at South Georgia, the data needed to bulk out a PhD, if I can put it that way …. To get enough data for a PhD required the analysis of those samples, and that I think was the thing that concerned me most. It was more a concern over whether I would have enough for a PhD than anger or anything else. I was annoyed, obviously, but nothing …

[Part 1 0:43:09] Lee: So how did it affect your scientific research? Did you have to go back?

Clarke: Yes, I mean it actually was a pivotal moment.

[Part 1 0:43:18] Lee: A blessing in disguise?

Clarke: Yes, I guess in retrospect you could call it that. It was pivotal moment in my career in that the ship northbound called in at Madeira, Bill Sloman got back on board together with some police officers to sort out what was going on. And Bill and I had this very interesting interview, and I had already decided at that stage that … I hadn't spoken to my parents or anything at that time because communication from the ship in the middle of the Atlantic was not feasible really. You could put a dial-in phone call to Portishead Radio but the reception was poor and early on, when it had actually happened, it wasn't even technically feasible to contact Portishead. It didn't reach far enough north. But by Madeira it was. I had already decided, without talking to anyone, that if BAS offered me the opportunity to go back for a summer and collect the material again, I would go. But I thought I would want to fly both ways to save time.

[Part 1 0:44:10] Clarke: So I had an interview with Bill Sloman and it became apparent there that Bill was wondering how to broach the subject of going back with me and I was sitting there wondering how to broach the subject of going back with Bill. Eventually I think there was a conversation on the lines of 'Cards on the table, Bill. I will go back for another summer but I want you to fly me both ways. Sign here.' was virtually it. So I went back the following season. On a personal level, what was interesting about that was that this girlfriend that I had left behind two and a half years ago had disappeared into the ether as far as I knew, was standing on the jetty when I got back. And the next thing I had to tell her was that actually I was going back for another six months, which didn't go down too well but there we go.

[Part 1 0:44:52] Lee: Is she actually your wife?

Clarke: No. She was. I have been married twice.

[Part 1 0:44:56] Lee: I beg your pardon. So OK.

Clarke: We did get married but it didn't last.

[Part 1 0:45:03] Lee: It's outside the perimeter of this interview.

Clarke: I have subsequently had two freezer incidents at BAS, losing significant amounts of material, but that is, as anyone who does physiology or biochemistry will tell you, that is par for the course. Freezers go down.

[Part 1 0:45:17] Lee: It wasn't enemy action in this case?

Clarke: No. One was a failure of the freezer unit and that was simply the unit failed. The other was incompetence. We were having some shelving put up and the guys unplugged the freezer to plug in their power drill and didn't plug the freezer back in. These things happen; there is nothing you can do about it. Everyone has little moments like that in their career and all you can do is carry on.

[Part 1 0:45:46] Lee: Comparing that early work you did down South with more recent work later in your life, and the advent of these remote operated vehicles, there are several changes in the way biologists went about collecting marine samples, weren't there? One was: in the early days you were trawling the bottom, which of course eventually was not the thing to do because it destroyed the environment in which you were trawling.

Clarke: Yes. I think there have been huge developments in all fields over the forty years but my field in biology, yes, I think the way we sample animals has been a significant change. Previously you sampled blind. You threw a trawl over the side and dredged up everything it caught and then sorted through, threw the rubbish back over the side and took the animals you wanted. And it would be wrong to say no-one thought anything of it. We did think about the damage we were doing but you accepted it and you looked at it you said 'The cove we are fishing is very big; our trawl is very small. We are not doing that much damage.'

[Part 1 0:46:47] Clarke: Actually if you do the calculation, you are not doing that much damage, but there was a recognition, as people changed their view of the natural world, and particularly their view of the sea, that this wasn't actually the right thing to do. And also alternatives became available, so it became possible to scuba dive but you could only scuba dive to a very shallow depth. Scuba diving, which sadly I can't do because when they trained me up, I found out I have a Eustachian Tube problem which prevents me from diving. It is a congenital thing that runs in my mother's side of the family and that meant I can never dive, and so that debarred me from seeing the animals *in situ*, which is something that I always regret, but it's just something that life has delivered. You deal with it, and so I had to think of other things to do, so I would bring the animals into the lab and work on them in the lab, but always knowing that I am missing part of the story which is seeing the animals *in situ*, which is what terrestrial ecologists can do. They can see their insects on the leaves; they can go out and look at them in the field.

[Part 1 0:47:51] Clarke: For much of my career I am dealing with animals that have come up onto deck or latterly have been picked out by hand and brought up by assistants because I can't dive. And then most recently of all, we have got the advent of very high quality imagery and the ability to take those cameras to depth with ROVs and manipulators them. So we can bring up individual animals, we can see the animals *in situ*. And the real challenge there, which I think actually some colleagues in the Antarctic have been leading the way internationally – these are German colleagues. It's easy to get lots of 'Gee whiz' video, high resolution and it's spectacular. Whenever the video is operating down there, there is always a feed in the bar or the lab and huge numbers of people come and look at it because they are interested in seeing the seabed, a camera tracking on the seabed.

[Part 1 0:48:44] Clarke: There is always an attentive audience. People bring their coffee down and sit in the lab, just to watch what the video is recording, and it's great. You end up with lots of what we call 'Gee whiz' video. It's fantastic but actually turning that into science is a real challenge. It's a difficult thing to do. You have got to get numbers out of it effectively and going from imagery to data is not straightforward but it's now routine. Those problems have been cracked; we know how to do it. Some colleagues, as I say, in Germany, in the Alfred Wegener Institute, were amongst the world leaders for a while, using their ROV in the Antarctic. So it's an area where I think Antarctic science for a while led the world. The rest of the world has caught up now, and the technology we use is far behind the technology used in industry. The ROVs used by the oil industry and the military far exceed the capabilities of the ones available to scientists for a long time. Now they are probably on a par but now the technology available to the military is far in excess of the capability of what is available to us.

[Part 1 0:49:48] Lee: When that technology was emerging, did you have to fight for it?

Clarke: Not really, no. It wasn't a question of fighting for it but it was a question of having to raise the funds. So as an example, amongst the last cruises that I did from NERC and BAS research vessels, used the UK's only deep water ROV and it's called *Isis*, which is based in Southampton and that was £6 million to build. And so that was obviously not something that BAS or NOC or even NERC could probably do off its own back. Actually the money came from a special pulse of money released by the Government in recognition of the fact that over many years the equipment and infrastructure available to the universities and the academic sector in general had slipped behind. So they gave out a huge pulse of money to bring it up to date and one of the bids that was made was for a deep water ROV. And as always, opportunism is everything, it just so happened that there was an incident involving a submarine and the recovery of material from a submarine.

[Part 1 0:51:10] Clarke: I can't remember exactly the details but I do remember that the UK had to utilise American deep water ROV expertise and this was politically quite sensitive. So just at that moment of sensitivity, the money was released and two very sharp individuals at NOC, the National Oceanographic Centre in Southampton, struck with a bid for the UK's own deep water ROV. The bid got put through so it's like everything else; you need to be in the right moment at the right time. So the trick was finding the source of funds to build it and also to run it because of course these

things have significant running costs. To run an ROV is a 4-man team and if you want to run the ROV round the clock, which you do when you are putting an expensive ship to sea, you want the ROV in the water all the time, you need more than four people because you have got watches to maintain. So it becomes very expensive in personnel but it has been an absolute boon to underwater biology.

[Part 1 0:52:10] Lee: So, in a layman's question, is it now, towards the end of your career, was it presenting you with samples and specimens you couldn't have otherwise … would never have got to.

Clarke: Yes, it was presenting me with experiences that I could never otherwise have had, seeing animals *in situ*, and some of the animals that I am watching on the video screens are animals that I have done work on but I have never actually seen in their environment, behaving naturally. You see the environment that the animals live in, in a way that you won't otherwise do, so that was new, and it presented whole new swathes of data we wouldn't otherwise have been able to get. And it was just visually one of the most amazing things I have ever seen. I think I would say I have seen three really dramatic natural events in my life. I have seen a total eclipse of the sun; I have seen the northern lights wall to wall, and I have seen smoker vents at depth in the sea, and I would say they rank with each other. It's interesting. The first time we located the vents, the lab was absolutely packed. We knew we were getting close because we had chemical sensors. This is volcanic underwater vents. They are called Black Smokers because what is actually happening is: the very hot water is emerging from the Earth's crust and the instant it hits the cold sea, a lot of the minerals in the water crystallise out. So it looks like a smoke stack, and it is actually mineral crystals, but they are called Black Smokers because the minerals are largely dark and it is dark down there so you are illuminating with the lights. We knew we were getting there because we had all the chemical signals of sulphur and other things in the water, so we knew pretty much that this was the dive we were going to find them, and the whole lab was packed.

[Part 1 0:54] Lee: This was on *James Clark Ross*?

Clarke: This was actually on *James Cook* I think. This was on *James Cook* at the time because the *James Clark Ross* was somewhere else. There was a powerful emotional impact on the people when it was seen. It was comparable to people's first experience of whales and that is something else that I hadn't appreciated. As a biologist, when I saw my first whale I was really quite excited. I wasn't prepared for the emotional impact that seeing great whales has on non-biologists. It delights and staggers me that for some reason whales have an enormous emotional and powerful impact on people. I don't fully understand it but … I love seeing them but it is the impact on other people that sometimes …

[Part 1 0:54:45] Lee: Tell me again a bit more about this video screen that was being observed by nearly everybody on the boat, or it seems that way. Tell me, just describe in more detail that day.

Clarke: Well what happens is that when you are driving the ROV itself, you have what they call the ROV van. It's basically the lab that drives it; it's two containers bolted together. So you have got the space of two shipping containers. It's on deck

and it's dark and one wall – it's like the *Starship Enterprise* – one wall is a complete array of video screens because the ROV when was down there has low resolution cameras so you can look where you are going. It's got sonar in case there is a wall ahead of you that you can't see; it's got a sonar looking back. It's got video cameras looking at the umbilical going back to the ship to make sure that that's OK. It's got strain meters; it's a hugely complicated thing. And you have a guy driving the ROV, a guy watching the tension and another guy looking after the navigation at all times. So they are looking to make sure you don't run into things or you can backtrack or you are keeping on the track that the scientists want.

[Part 1 0:55:47] Clarke: Then behind them are three scientists on watch and they are also recording all of the data cameras, high resolution and they are recording them to digital video disc and to digital tape and to CD, and each one is done three times, twice. So there is an incredible amount of changing of media to go on. So it is quite complex. Someone else is recording also electronically and longhand interesting events as you go along, saying: 'crab' or 'fish' or whatever. These are all recorded at the same time. The biologists then say 'Take a photograph of that one, we want that one.' So it's quite an intense thing, and for that reason general people not involved in watch keeping are not allowed in the van because otherwise you disturb the process, and don't want to wrap six million quid's worth of umbilical round the ship's propeller. So what they do is they have a large plasma screen TV in the general lab which is relaying one of those video screens and the one they relay is the high resolution biological camera because that's generally the pretty pictures. So everyone else, who isn't on watch, and who is interested in, sits around in the main lab, which is a big spacious lab, watching this TV.

[Part 1 0:56:49] Clarke: And the engineers off watch will come in with their softie or their cup of tea. You are not supposed to have teas in the lab but everyone takes them in and sits around and often there will be five or six people watching the video. On the occasion that we found the vents, there were probably 20 or 25 people watching the video. It's the old old thing; the tension mounts. 'We are nearly there.' The images start to show suddenly that you are entering a vent field and the ones you see are not smoking; they are dead ones, because vents have a relatively limited lifespan. They probably only run for a few years. You find dead vents. 'Ah, we are in the right area.' And then you start seeing the animals, because the dead vents don't have animals round them. Then you start seeing animals that are probably indicating there is a vent nearby. Then you see more animals. The tension builds; you couldn't write the script. And then eventually the camera suddenly goes dark as you enter a smoke field. There's an enormous cheer really, yes. It's exciting.

[Part 1 0:57:58] Lee: Are you seeing creatures you had never seen before?

Clarke: Yes, in the sense that the types of creatures are well known. I mean we are seeing starfish; we are seeing crabs, galatheid crabs, we are seeing snails; we are seeing worms. Those are all well known to people but it is the type of crab and the type of worm that is different. They are distinctively different so you know they are new so you are not seeing little green men or anything. You are not seeing anything outlandish that you have never seen before. They are all well-known types of animal but the individual forms are different. One of the starfish, for example, that we came across quite frequently we soon learned was symptomatic of being close to an active

vent, was a very characteristic starfish with seven arms. Starfish normally have five arms and our first thought was 'That must be something that it's been damaged in some way and grown two extra arms. No the next one, that has got seven arms too. That one has got seven arms.' So that goes down as a seven-arm starfish. It's only on collecting a sample (which we did), use the manipulator to put one of these in a box, bring it to the surface, take samples for DNA analysis and then the rest of the animal is preserved and somebody will have to look at that to work out … The starfish people on board know roughly what sort of starfish it is but we also know that it has never been seen before.

[Part 1 0:59:15] Lee: I can see the value of pure science, just recognising a new species that hasn't been seen before, but these are animals living in a very specialised immediate environment. I guess if they drifted too far away from the vent, they wouldn't survive. Have you learned anything that is really useful in your time?

Clarke: Well it depends how you define 'useful'.

[Part 1 0:59:36] Lee: Useful to mankind.

Clarke: Not in the immediate sense, no. I am going to answer this in a slightly oblique way.

[Part 1 0:59:54] Lee: Any way.

Clarke: One of the things that has changed in the way Government views science over the 40 years that I have been here that I have been doing science, is to move from a recognition that there is a general value for mankind in understanding the world and a recognition also that the things that are going to generated large amounts of money will often be things that you hadn't expected, the unexpected. Everyone talks about Teflon and the Space Race, but that is a trivial example; there are many more fundamental examples than that. We have moved to a system of very much more prescribed science where you are expected to demonstrate, even before you start, what the benefits to the country are, by which is meant 'Will the Treasury get money from it?' In that sense, the work on hydrothermal vents has contributed nothing. No we won't get any money from it initially. What it has contributed is a much improved understanding of one aspect of how the world works, and so in that sense it is exciting. We have discovered things about them that we hadn't know before. In a scientific context it is really very important.

[Part 1 1:01:00] Clarke: To take an example, which is easy to express, one of the reasons we were interested in the vents in the Antarctic is that we now have enough work done on the vents in the Pacific and the vents in the Atlantic to know that the animals you find in Atlantic vents are very different from the animals you find in Pacific vents. Some types of worms, for example, are only found in the Pacific; some types of crustaceans are only found in the Atlantic. So what you see around a vent is very different in the Atlantic from what you see around a vent in the Pacific. So the obvious question is: since we are looking at vents not that far from the Drake Passage, are they going to be Atlantic type vents, are they going to be Pacific type vents or they going to be halfway between? And the answer is all three of them. They have some links through to the Atlantic; they have some similarities to the Pacific, but they also

have lots of things that make them distinctive in their own right. So we are learning something about how vents work. Understanding how the energy supply from a vent to the animals works gives you an increase in understanding how energy flows in systems. So that at some stage may well be useful. At this stage it is just an intellectual advance in understanding how the world operates, and it has no obvious immediate benefit to mankind other than better knowledge. But sometimes interesting things emerge.

[Part 1 1:02:28] Lee: So at the time it was felt that it was 6 million quid well spent?

Clarke: Well yes. I think there is a general recognition that this is a good piece of kit. Whether the work on the vents in the Antarctic in itself justifies six million quid is probably arguable but the general advance of knowledge that we have and the capability that it delivers to just maybe solve … it might solve a technical problem at some stage. I think it is recognised as being a good investment in science.

[Part 1 1:03:02] Lee: That was when, Andy?

Clarke: Ooh I don't know. That would probably be of the order of after 2000; 2005 maybe. I would guess around 2005 but hindsight has a tendency to telescope time.

[Part 1 1:03:17] Lee: The question I want to ask you is: if that proposal was being made today, in the current economic climate in the world of science, would they still say that six million quid is worth spending?

Clarke: I'm not sure that you would be able to get the six million quid. That's not an answer to the question you asked, but it is an alternative answer. At the moment money is very tight, so I don't think you would actually be able to raise the money. And the money for that did come from a specific pulse of money to introduce new equipment and infrastructure to universities, and that was why in the end, for example, the equipment is housed at the University of Southampton. It's actually a joint facility with NERC but it's in the university sector that generated the argument for it, rather than NERC.

[Part 1 1:04:03] Lee: At the time you were preparing to retire, were you aware that science was not getting the kind of money it used to get?

Clarke: Yes. In the time that I worked at BAS, I would say that there have been cycles. There have been periods when the money available for science in general in the UK, in the 60s for example, was generally very good. Then there were periods of financial constraint which were largely driven by UK-wide recessions – the Three Day Week – we all remember such times. And then there have been times when the money had been relatively freely available and I think there is a distinction to be drawn here, in that post- Falklands, the money was good specifically for BAS. In the 1960s, before I joined effectively, I think money for science in general was good. Obviously one gets to know the cohort of people you move through the organisation with, and a number of my colleagues have retired around the same time as I have.

[Part 1 1:05:15] Clarke: A group of us retired over a three or four year period. Many of us have spent our entire, or almost all our science careers in BAS and think we

agree that we happened to be born at the right time. We all missed the war, so I don't remember rationing but I remember the end of rationing, and we lived at a time when there was a general goodwill towards technology and science, and science was well funded, partly on the basis of the war experience, that technology generally was a good thing. And that changed over the course of time. Other priorities came in. It was costing more and more, for example, to generate food. It was costing more and more to keep people healthy. The budget isn't limitless, so those are political decisions but as a result, this era of good funding for science moved into a much more competitive area. And as we all know there are pressures on public service pensions and other such things, so I think I represent a cohort that managed to have a science career when we didn't have to struggle to find a job. There was generally good funding for the science we wanted to do. Post Falklands there was good funding for what we wanted to do in the Antarctic and we were able to retire before the real squeeze on public service pensions came in. So I think we have lived in a golden era and I do think we recognise it as well. The recognition involves trying to work out ways of making it less tough for the people that come after us. We tried to do such things but you are limited in what you can do because your hands are tied by UK-wide factors.

[Part 1 1:07:03] Lee: Let's pause and reconvene shortly.

Clarke: Right.

[Part 1 1:07:11] [End of Part One]

Part Two

[Part 2 0:00:00] Lee: This is Andy Clarke, interviewed by Chris Eldon Lee, on the 17th of October 2012. Andy Clarke, Part 2.

[Part 2 0:00:10] Lee: So there were your very long service with BAS, what were the major evolutions you have seen? Let's talk about Health & Safety? Was it non-existent when you first went South?

Clarke: Health & Safety was non-existent in the way we see it today but to say that Health & Safety was non-existent at the time would be unfair. I think what we had at the time was routine common sense and an awareness of what was safe and not safe to do. As with everything, you get the occasional things wrong. So I think there was a very clear sense of what it was sensible to do and what was not sensible to do and in terms of an environment like the Antarctic, one of the critical aspects of that was the policy at the time of doing two winters, because that meant that in any given winter, you'd have maybe half the winterers had never wintered before and perhaps were naive, and the other half had wintered before, maybe several times. And hence they did know what was safe and not to do and that was a mechanism for transferring information and experience. As we move now to a period of much shorter contracts and the policy now is not to winter anybody for two consecutive winters, that carries consequences I think for the transfer of knowledge and experience across the generations, or cohorts of people. It doesn't take place any more and that's the worry that concerns me, but it's not something that I have to deal with, obviously, now being retired. It's something the current people have to deal with.

[Part 2 0:01:52] Lee: So what came naturally in your early days, in the '70s, best practice being passed on from one generation of Fids to the next one, one cycle of Fids to the next, now has to get written down, doesn't it?

Clarke: Yes, it does. You have to codify things in all manner of ways and the Code of Practice for boating might run to seven of nine pages and much or those seven or nine pages list things which are plain common sense. But in the environment in which we now operate, if you don't write those things down and there is some indication that everyone who should have read it, has read it, and something happens, all hell breaks loose. It's just the world we live in.

[Part 2 0:02:36] Lee: Did all hell break loose in your 39 years?

Clarke: There have been occasions when yes. I think, positive is the wrong phrase to say it. I think an example of how things change in the learning from experience, was the sad event of Kirsty Brown who was a biologist that we employed. It so happens that she wasn't my student; she was a colleague of mine Lloyd Peck's student. We alternate them and Kirsty was one who being supervised by Lloyd, a colleague. And the way we worked that system was that the person who was supervising them went into the field in that first season with them. That was a logical way to help set them up and as is well known, Kirsty was drowned by a leopard seal, and that caused us to revise our Health & Safety in respect of diving in quite a serious manner. But in the end, we didn't make that many significant changes. We did make some significant changes in response to the incident but much of what we continued to do was what we had been doing already. We just made one or two small changes. What was also interesting about that particular incident was the response of her parents which was remarkable in my view and that was to say, straight out, that they had no problems whatsoever with the way BAS had operated their diving system and this was just one of those things that happened.

[Part 2 0:04:08] Clarke: They were obviously very very sad to lose their daughter but they also said that she was doing something she always wanted to do, which I thought was a remarkable reaction, and quite uncommon; it's not one you would expect widely but was real. As a result we put a ban on snorkelling in shallow water, in fact a ban on snorkelling full stop in the Antarctic now, and we instantly switched from black drysuits to brightly coloured orange drysuits, the reason for that being, the rationale being: Kirsty was small and she was snorkelling in the shallows amongst ice which is what seal pups do, and our interpretation is that the leopard seal saw Kirsty as a seal pup and took her and drowned her in a way they would drown a seal pup. So the changes are (a) make sure you don't look like a seal pup by changing your drysuits from black to orange and (b) actually don't be in the environment in the first place.

[Part 2 0:05:01] Lee: Where were you at the time?

Clarke: I was back in the UK and so this happened during winter. I had actually been on the base in that summer. It so happened that Lloyd and I coincided that year, which is not common but it did happen that year.

[Part 2 0:05:15] Lee: How did you feel about how BAS dealt with that back here.

Clarke: I didn't get directly involved. Lloyd did because he was the line manager and from my experience, looking at it from the outside, I think they handled it fairly well, and I think that was helped by the remarkable reaction of Kirsty's parents. That made what was a difficult thing, made it less overwhelming than it might otherwise have been because one could envisage, if the wrong things had happened, that all hell could break loose from above, by other people covering their back *et cetera*, and that didn't happen. It was a difficult time but I think broadly from my perspective on the outside – I have to emphasise that I was on the outside of that managerially – I think they handled it fairly well, as I think in general BAS … I remember vividly the loss of three people from Argentine Islands early on in my time at BAS, when Dick Laws was Director, and this was a really tragic incident.

[Part 2 0:06:24] Clarke: Three people had been climbing on the mainland. Argentine Islands base, which we now call Faraday, is an island so you have to travel across the ice or by boat depending on circumstances. And they had travelled overland, climbed a mountain and came back and it was apparent that the weather was not good and the ice wasn't good so they stopped off at a small safety hut. But they were keen to get back and they made the wrong call over the safety of the ice and the weather conditions. It was their call and against advice, they decided to travel and the ice broke out and they got carried out to sea and obviously died and drowned out at sea. We don't know exactly what happened but we know in general what happened and obviously Dick appeared in front of the local media. I remember he was interviewed on television and was asked about training and he explained. I thought it was remarkably fair and balanced.

[Part 2 0:07:17] Clarke: He said ' We do train people. We give them excellent training. We give them advice, but in the end, you have to recognise that part of the attraction of this environment to some people is that it puts them in a situation where they have to make a decision. All the times they make the right decision because we've trained them, you don't hear about. On this occasion, it's very sad but they made the wrong decision.' There was no covering up. I thought that was excellent and I think in general that is how BAS has reacted to the thankfully very small number of incidents. If you look at the statistics, you are much more likely to be killed in the UK than you are in the Antarctic, given the age and everything else. But accidents do happen and they have to be dealt with and lessons have to be learned and I think in general BAS has done that.

[Part 2 0:08:06] Lee: A question from Inigo Everson: you were Head of Division for a number of years under three Directors, each with differing management styles. What were the most favourable features of the management styles of those different directorates, that you would encourage adoption under the present regime, and why?

Clarke: That is a typical Inigo question. Yes I did have three Directors. They were very different.

[Part 2 0:08:31] Lee: There was Dick Laws, Barry Heywood and David Drewry?

Clarke: And actually four. Chris Rapley, I was also under Chris Rapley. They differed in a number of features. One thing they differed in, I think, which is more relevant than might seem, is their scientific credibility.

[Part 2 0:08:51] Lee: Tell me more.

Clarke: Dick Laws came with a very strong science reputation which was thoroughly deserved. He had worked in Africa on elephants. We always joked that Dick only worked on big things: elephants, rhinos, elephant seals, whales, but Dick had an established reputation when he arrived at BAS. He was also a formidable person and so in that sense he had gravitas and clout and you knew who the boss was without anybody saying, but he wasn't particularly collegiate and I only overlapped with him very slightly. I never actually was formally Head of Division under Dick. Barry was a Director who was very good with people but didn't have the science background or science credibility that Dick did. David Drewry came from the Scott Polar Research Institute which meant he carried some credibility with him and he I think, was the most collegiate of the Directors that I worked with closely.

[Part 2 0:09:57] Clarke: I clashed with David on a number or instances, one of which I got right and one of which I clearly got wrong. I was dead set against the introduction of the Dash-7 aircraft because I thought this was stretching our finances too far and wasn't going to deliver anything of any meaningful logistic capability. I turned out to be wrong; it has actually been a terrific thing although the centrepiece of our disagreement centred on whether or not we should fit skis. In the end the decision was taken not to fit skis because that was getting very very expensive, and that was my main concern. As it is, the other fix we did which was put a cargo door in it, actually turned out to be a positive bonus for BAS because we licensed it and we got money back for it, and the Dash-7 has turned out to be brilliant. I accept that.

[Part 2 0:10:41] Lee: What did you get right?

Clarke: It was really the speed with which we introduced women was I think one area where David was keen but slightly reluctant I think because that is one where we pushed. And the other area where we clashed was I think: there was an incident over … I had a formal interview with David and Barry (who was Deputy at the time) over how well the Marine Life Sciences was performing. I thought we were doing quite well and I went up one day and had an interview and I came out with my ears burning because I had been told that we were not up to scratch and we weren't publishing enough. I went out thinking 'I don't see where that is coming from.' So I actually asked David. I said 'What is the evidence? If you say we are not up to scratch, you must have a standard in your mind against which you are comparing us. What is the standard?' And I couldn't get an answer. It was just 'Well we don't think you are doing well enough.' And so I pushed hard to say 'Tell me what you think I should be doing. I need a standard. I need a number. Tell me, is it number of publications? If they are not enough, how many do you expect?' I pushed hard. I probably pushed too hard and I didn't get an answer because actually there wasn't an answer.

[Part 2 0:12:02] Clarke: So I went off and I spent three months quietly, in the evenings, generating some data and I produced a paper – it was only about four pages long which belied the amount of work that went into it – where I analysed the output

of our sea-going scientists. It was particularly our sea-going scientists that was the nub of the criticism, and used the only other sea-going programme that was at all comparable in the UK, and I was able to demonstrate that we were four times more productive than that university based … No it wasn't university based; it was joint university and NERC based at another institute. I was able to say 'There you are.' But as always of course, the trick with management is to never admit you are wrong and I never got an acknowledgement that actually it had been wrong.

[Part 2 0:12:50] Clarke: We simply moved on to other topics, but that was a specific instance. In general, I thought David was very good for BAS. He was very good at profile; he was excellent at manoeuvring BAS into the right places and making sure that BAS and David Drewry was seen in the right places and he did a tremendous amount for our image. He was very good. In dealing with him on the day-to-day running of BAS, I found him easy to deal with. He was collegiate; he listened. Usually we did what David thought was the right thing but there was genuine discussion and we could change his mind. With Chris Rapley, that wasn't the case. He was the one that I had least empathy with at the end. We had very different views on management style and we had very different views on how you treated people. And in the end, it became very difficult and it was decided the best thing would be, for my health and also other things, if I stepped sideways.

[Part 2 0:13:52] Lee: Chris had not been to the Antarctic. He was brought in from a different world, wasn't he?

Clarke: Yes.

[Part 2 0:13:57] Lee: Are there pros and cons in that?

Clarke: No. In general, as a philosophical point, I think bringing people in from the outside is good, I would suggest as a broad brush statement, and I think it was particularly good for BAS when we started recruiting from without at senior levels, rather than recruiting from within because I think we had become quite narrow in our view and narrow in our experience. I remember vividly we brought in Frank Curry who came from the MOD, interesting guy Frank. He and I clashed occasionally but we remained on very good terms. You are working colleagues and you have disagreements at times but we ended up most of the time as very good colleagues and I have a lot of time for Frank, and I remember vividly him coming into one of the first Director's Committees and sitting and saying 'Well we need to produce a 5-year plan. Can I see your 5-year plan?' To which the response was along the lines of 'What is a 5-year plan?' So Frank brought in a rigour of view and actually that turned into a major restructuring event because he produced a 5-year plan and then came back to the Director's Committee and said 'If we don't make some major changes, you will have to make most of your science staff redundant in five years' time because this is the way the figures are going.'

[Part 2 0:15:17] Clarke: And we ended up on what became known as the Way Forward Restructuring Programme, which was an interesting introduction to management for me because it meant I had to wrestle with the problem of seeing the big picture at the management board, having to sell the changes to the staff who were going to be affected, and that was an interesting time to me. The first thing I did when

I took over was rearrange the structure of the research groups, and that didn't go down too well with some of my colleagues because effectively we had a system I had inherited where every middle manager was effectively a manager of a research group, often a research group of one. And I just amalgamated them which effectively was disenfranchising people in some ways but I felt it was a necessary thing to do and I did it. It wasn't popular but in the end I think I only lost one member of staff who threw their toys out of their thing and moved on. Everyone else stayed around and lived with it and actually made it work.

[Part 2 0:16:25] Clarke: Again, you don't get people coming back and saying 'I was wrong; it was the right thing to do' but we started to do some good stuff and people recognised that the change was necessary. The change that Frank Curry's analysis introduced was far more widespread and that was the suggestion that we closed Signy and closed Faraday. The Foreign and Commonwealth Office wouldn't allow us to close Signy, so we had to have a Way Forward Part Two because we had to go back. The Foreign and Commonwealth Office wouldn't accept our first round of proposals, so went back and we moved Biology from Signy to Rothera which was a real problem for some people who were emotionally attached to Signy. But we did it and I think it has proved generally a good thing. I would admit that we did lose some opportunities for terrestrial biology by moving from Signy to Rothera but I still feel that what we gained outweighed what we lost.

[Part 2 0:17:20] Lee: You have answered one of Lloyd Peck's questions, saying that. Let's face it; you were a biologist. Did you enjoy management?

Clarke: Yes and no. I did enjoy management when I was working for Directors that I had some empathy with. When I was appointed, the rules of the game were … There was a contract that you signed effectively … I mean you don't actually physically sign contract at that time but the post you accepted was one which was akin to the old Head of Department in a university, which was that you were expected to do what you had always done: academic work, research, but also manage the department, or manage the Division. And that split was always deemed to be the two facets of the job. Managing to do both facets of the job was a real struggle but there was a recognition that both were important, and I had always viewed the – I mentioned it before already – that the credibility as a scientist was important if you are going to manage scientists. That's something I have always felt, and remain. I look around at society in general and feel that that can be generalised to society in general.

[Part 2 0:18:39] Clarke: I don't believe in bringing in professional managers from the outside. 'Because you have run the Post Office, you can now run the FA' or *vice versa*. I don't think that necessarily works. So at that stage I enjoyed management. There was a lot of tedium to it, a lot of frustration to it, as my father … He never gave me any advice; he just made a comment once that 95% of your problems were caused by 5% the people, and that is exactly right, and you have to deal with those people. You try and make life as positive for them as you can. And what I particularly enjoyed was the ability to create opportunities for people that you saw potential in. You can't do it for them, but what you can do is open a door, point a direction, or in the case of women scientists, open the door to get them in, and that was very rewarding.

[Part 2 0:19:32] Clarke: I look back on that and think 'Yes, I actually enjoyed that.' And I got feedback from it. People would come up to you and people did come up to me when I retired and said some very nice things. I obviously did some things that people appreciated. When it came to working with Chris, we were just very different personalities and I did not enjoy that at all, and hence I got out. And to Chris's credit, he recognised that we had to make a difference and he was quite instrumental at smoothing the path for me to do something which is not easy to do in the Civil Service, and that is to move out of Management back into Science. It doesn't compute, in the system.

[Part 2 0:20:11] Lee: Can you elaborate a bit more about the final straw, that made you resign? This is the Patrick McGoohan Number Six question, isn't it? Why did he resign from ??? [inaudible]

Clarke: Yes. I had a small mental breakdown. That was quite straightforward.

[Part 2 0:20:23] Lee: Instigated by being at BAS?

Clarke: The tension, yes. The tension of trying to manage. Chris had a very different view of what the Heads of Divisions were there for, which was that in his view it was quite straightforward. You shouldn't be doing science. In fact if you did science, you were actually being disrespectful to the people you were managing, because you were spending time not managing. That was his view and that was not what I had signed up for initially and not what most of the Division Heads had signed up for, so it was an element of the goalposts being moved whilst you were still in post.

[Part 2 0:21:00] Lee: Had your scientific work suffered because you were also doing managerial … ?

Clarke: No, it had changed. When I took on the job, at the time when you could still do science, there was a recognition that I had to do a different type of science. I couldn't, for example, do lab work because a lab experiment would involve you being in the lab two days continuously or I had to go and take this out of the water bath at 12 o'clock or I had to do X or I had to do Y. There's no way can do that in a managerial job, so I did a different type of science. I had a research assistant with me and she (because they were almost all women) could do the work in the lab and we would interact and I would be down the lab every day checking that everything was OK. But my interaction might be five minutes that day and the rest of the time I am doing management stuff. But the science is carrying on and I have to write it up in the evening. Or you write more review type or reflective type articles that aren't dependent on your being in the lab or in the field all the time. But I kept up a field work and when I went to the Antarctic, for a season at Rothera, I would do a science project but it wouldn't be a full time science project. I would be in the lab, doing stuff but at the same time I would also help out with the management of the lab and the management of the base.

[Part 2 0:22:13] Lee: So was it Rapley's decision to withdraw your scientific role, your direct science role completely? Was that the final straw?

Clarke: That was a part of the tension. I think there was a tension because Chris's managerial style, which was very autocratic, was not to my taste. It was a very non collegiate … There was a Board, but basically the Board's function there was to agree to what people wanted. It wasn't just Chris; it was more complex than that but essentially it felt no longer collegiate. I think in the end, trying to resolve those tensions internally, led to medical problems. So the medical grounds were the ones which were an acceptable face to enable …

[Part 2 0:22:56] Lee: You got a sick note, effectively?

Clarke: I didn't actually go as far as a physical note but it was recognised. One of my colleagues actually, it was David Walton actually, they went to Chris and actually said 'You have to do something, Chris, otherwise there will be a medical case on your record, basically.' That was the way I think, I believe, he phrased it. I wasn't present at the time but …

[Part 2 0:23:18] Lee: What about NERC? Was NERC a contribution to your disheartening?

Clarke: No it wasn't and actually I have to say that when it was decided that the resolution should be that I moved out of management and someone else would take over running the Division after ten years, and I would move back doing science, credit was due. Chris and John Hansford at NERC were both very supportive of that move. So Chris I think, recognising that he had to do something, then actually was very good.

[Part 2 0:23:53] Lee: Would this be John Lawton?

Clarke: John Lawton was Chief Executive at the time and I got tremendous support from John, someone I have known for some time. He is an ecologist so I had known John obviously.

[Part 2 0:24:06] Lee: But in your exit essay, when you left the organisation completely, you are actually quite critical of NERC, aren't you?

Clarke: Yes.

[Part 2 0:24:15] Lee: Was that something which came in the last ten years.

Clarke: No, I think our relationship with NERC has been up and down all the time. I think, to finish answering the first question, I wouldn't say that the difficulties that I experienced working with NERC contributed to the problem that led to my moving sideways. That was purely I think internal in BAS; that was my attempting to resolve impossible things to resolve, and if you can't resolve them, they build up and eventually we resolved it by my changing the job.

[Part 2 0:24:42] Lee: And were you happier?

Clarke: Oh yes, instantly, yes.

[Part 2 0:24:46] Lee: So what was the problem with NERC, then?

Clarke: The problem with NERC is it goes back to a structure. It's not a problem … Perhaps I should distinguish. I have always felt that BAS has had problems with NERC and as I was part of senior management in BAS, then those difficulties I felt quite sharply. I don't think there was an individual problem with me as an individual. It was more the NERC-BAS relationship and that goes back to the way BAS is organised. It's effectively a structural conflict in that you have the Foreign and Commonwealth Office which is the reason we exist, effectively, but they don't fund us. What is now BIS (the Department of Business, Industry and Science) funds us; the name changes at regular intervals, but basically you have an organisation that is your rationale for existence and has part of a say in what you do and another organisation that provides the money, and hence would like to dictate what you do. And that tension has always been there, and it means that at times the relationship can be good and at times the relationship can not be good. It depends very much on the individuals concerned at the senior levels in all of those organisations.

[Part 2 0:26:05] Clarke: So the nature of that relationship was critically dependent who was the Chief Executive of NERC, who was the person responsible at the FCO, and who was the Director of BAS. That trio was critical and at times when that relationship worked, BAS-NERC relationships were very good and I would quote the time when John Lawton was Chief Executive as being a very good one. Previously I would go back to Eileen Buttle and prior to that I know, talking with Inigo, that he would cite Ray Beverton. I was so junior in the organisation when Ray was Chief Executive, it really didn't hit my radar, so I can't comment on that. The two I can comment on are Eileen Buttle and John Lawton who I think have both been sympathetic to what BAS was trying to achieve, sympathetic to the FCO's aim but also keen to drive up science standards everywhere. Other Chief Executives or other Directors of BAS, the relationship has not been so good, and when the relationship is bad, it's not good for you when you have a bad relationship with the person who is actually handling your money.

[Part 2 0:27:09] Lee: But one of your frustrations seemed to be that you seemed to have greater scientific recognition outside the UK than you did …

Clarke: I think that's true of most polar scientists actually.

[Part 2 0:27:19] Lee: Why is that ?

Clarke: I think it is partly the history of polar science. It's partly valid but I think in some ways is no longer valid. In the early days, polar scientists worked in polar regions on polar problems and they were largely divorced, not entirely but they were often divorced from the mainstream of their science going on elsewhere. That varied a lot depending on whether you were dealing with a biologist or a physicist or a geologist. I am speaking here essentially from a biological perspective. A lot of what we were doing in those early days was descriptive, finding out how the land lay, sorting out what was there, who was there, how many of them were there. Really basic stuff, stuff that was done 200 years ago in the UK, and that I think led to a feeling that the stuff that these guys were doing in the Antarctic actually wasn't very

exciting. And actually it wasn't very exciting but it was absolutely essential and we tended to publish it in non-mainstream Antarctic journals.

[Part 2 0:28:27] Clarke: So starting with Dick, driven on by David Drewry, but also driven on particularly by John Lawton as the Chief Executive, or before his time as Chief Executive when he was commenting our science, either formally or informally, there was a pressure to say ' Well you guys have got to come into the mainstream.' And we did and that I think is something that happened significantly in the years that I was in management and subsequently. I tried to move things in that direction by persuading people. 'I am going to put this into the *BAS Bulletin*.' 'Oh no, don't put it in there. You have got something interesting to say. Put it in a general ecology journal.' And that was a slow transition and now it is routine. People don't look at polar journals at all. People now look to get their stuff in *Science* and *Nature*. We have made the move. However, there is still I think in the community at large in biology, a feeling that actually the really exciting biology is done at Imperial College, and Oxford and Cambridge and the rest of you are really second raters. There used to be a third rater category for people in the polar regions but that has changed a bit now. So there is an element of history in it but I think it is, it has been a frustration for many scientists. There have been many scientists in BAS who have had very high reputations abroad but as you say are unrecognised in the UK because all communities have sub communities and cliques within them and the Ecology community in the UK is uninterested really in what is going on in the ecology of elsewhere.

[Part 2 0:30:12] Lee: Let me quote: 'I can recall no instance when NERC has asked of its institutes what he might do to help improve, develop or support the science undertaken within those institutes and none of the major scientific advances that have emanated from NERC institutes in the past have ever been the result of such top-down direction. All have developed in the grass roots within the institutes and gone up.' Hard stuff.

Clarke: Yes, I think that's true. There's two elements to that. I think the second point is: I would argue that almost all science advances come from grass roots. It's very very rare I think for a science manager somewhere, sitting to say 'I think we should do X.' and it is resulting in a large major scale advance. Scientists sit in bars and talk. 'What do you reckon about doing this?' and that's how ideas develop. Sometimes they develop into something which is really significant, often they don't, but the really powerful advances come from the grass roots up. The first comment I think is symptomatic of how all central administrations work. They know better, but I use those words quite deliberately because a colleague of mine used to run a NERC institute and he moved abroad to run an American institute and I met him soon after he had moved. I was at a conference in California and we sat in the bar, and I said hello. He said 'I am getting on really well, really enjoying it. I haven't got my Green Card yet and I can't buy a car because you can't do anything without a credit card and I haven't get a credit card without a Green Card.'

[Part 2 0:31:48] Clarke: So he was talking about the difficulties of moving, but he said 'I had a really interesting weekend. I went to see the sponsors of the lab.' Like many American labs, a large amount of their income is philanthropy so you have the Mr X Building, the Professor Y … because they are the people who funded it. So as the new

director of the lab, he went to the funding people and had dinner with them. And he said 'I was standing around; they gave me gin and tonic and said "There you are. I am just going to finish the meal. Please meet these people who sponsored the lab." And one of them came over and said "Ah Professor, I am pleased to meet you. I am so and so. What we need you to tell us now you are here is what we can do to make the science in the lab better."' And he turned round to me and said 'I worked 25 years in NERC and nobody ever asked me that question.' And I thought 'It's true.' It's partly symptomatic of how hierarchical organisations work. The central structure of NERC used to be a very small Directorate that handled money and did … It's now become the centre piece and it likes to direct from the centre outwards.

[Part 2 0:32:57] Lee: I was quoting from your NERC exit questionnaire which you must have written about 2009. OK. 'Any scary incidents accidents or near misses?' 'Yes but we do not mention these' was your reply. Well actually this is when we do mention some of them. Did you ever fear for your life?

Clarke: Yes. When I wrote that answer I had one particular event in mind. Obviously there are things when you go back and go 'Ooh, that could have gone the wrong way.' And sometimes you think 'I need to say something about that because we have not encountered that before.' And sometimes you think 'What a stupid idiot!' I am human like anyone else. In the days when I was at South Georgia, we had a policy for outdoor recreation which meant that you could roam freely over a large area of terrain solo and we all used to do that, and I have always liked being on my own when I am out in the field. So I enjoy birding with other people but I actually like being in the outside world on my own. South Georgia was heaven for that because you could go all day walking across the terrain.

[Part 2 0:34:09] Clarke: And on one occasion, I wanted to get from A to B and it involved crossing a small piece of ice and that ice disappeared over the horizon and down, and it was small and I decided I would go across without putting crampons on. And I slipped and had to do an ice axe arrest and I amazed myself with the speed with which something that I had only practised actually happened in reality. I did actually have my ice axe with me and I was carrying it properly, so I was able to do an ice axe arrest. And now I am stuck in the middle of the ice thinking 'Well now I am hanging on this ice axe, I now have to get myself back without crampons and I am on a slope like that and I know that that slope goes a long long way.' And if I slipped I'm not likely to have recovered, so I had to kick myself into the ice backwards and I had extremely bruised feet for quite some time, though I never revealed it to anybody at the time.

[Part 2 0:35:03] Lee: It wasn't in the base report?

Clarke: No, you didn't mention things like that at the time. I just got back and said … Basically I got to the other side, sat down for a while, and probably had a cup of coffee and a biscuit or something, or a snacky base or something to calm down and think 'Well that was stupid, I have learned something from that.' And left it at that. That was a lesson to me and I never mentioned it to anybody.

[Part 2 0:35:25] Lee: Until today?

Clarke: Until today, yes.

[Part 2 0:35:27] Lee: Anything that made you laugh out loud?

Clarke: There's probably been loads of those. Well yes, I suppose I do have a sense of humour and so there have been lots of … Can I think of anything that's specific at the moment? Probably not. But in general there is a lot of humour down there and Fids are notorious for having a black sense of humour, and there have been many incidences of such things, but I can't think of one off hand but yes. It's the famous thing: 'A sense of humour must be maintained at all times, and I think of the people who are successful in the Fids environment, a sense of humour is the thing that probably helps carry them forward.

[Part 2 0:36:10] Lee: Tell me about working with the Americans. What are the big differences between the United States Antarctic Programme and BAS?

Clarke: Oh many and varied. I did two trips with the Americans: one to McMurdo in 1989 and then 1979. 1979-80 season at McMurdo and then the '84 season at Palmer station, and those are the two seasons that I have done with the Americans, full seasons.

[Part 2 0:36:40] Lee: Both as invited visitors?

Clarke: Yes. Different people inviting me and I thoroughly enjoyed both experiences. McMurdo was interesting. McMurdo was my first experience of a mixed station, so that was interesting. There were elements of that that were really quite favourable, elements which were typically American, bizarre. I will quote one which might seem a bit tasteless in a way but it isn't because it reflects an incident the previous year. There is a medical centre at McMurdo which has pregnancy testing kits but no condoms. That summed up, I think, very often what I found it an extremely frustrating environment bureaucratically to work in. As an example, a telex came in to me and there was a system where a flag went up when there is a message and then you go and pick your mail up, because the aircraft are coming in all the time so mail is quite frequent. If there was mail arrived, the flag went up and I went in to check and I was in and somebody said 'Did you get your telex message?' 'What telex message?' 'Oh there was a telex message for you.'

[Part 2 0:37:55] Clarke: So I had to go over to the Chalet which was the Head Office there, built like a Swiss chalet. That was why it was so called. It was the Head Office and I went and knocked on the door and 'I believe there is a telex message for me.' 'Name?' 'Yes there was a message.' I said 'Well can I see it?' 'Ah, I dunno. Yeah, I guess so.' And it turned out that these things print out on multiple copies and they had filed all four copies into the relevant files. The only person who didn't see the message was person for whom – it was a trivial message – so there was frustration. But scientifically I would say I was really impressed with the quality of the science that was being done. What was also impressive was the scale of the science that could be undertaken. It was massively greater than we could do, but then it's a huge investment. McMurdo was a huge station. It's got helicopters; it's got C130 transport; it's got Twin Otters coming in and out. They can do things that we can't do, and I was also impressed by the positive effect on the science of having a large number of

university academics coming through, rather than working internally as we did. So it convinced me of a number of things, that trip.

[Part 2 0:39:02] Lee: They were passing through in quick succession?

Clarke: Yes, quite often, or sometimes you only saw them briefly before they went in deep field, and sometimes they would be there for relatively short periods of time. But I think what I took from those two experiences were a series of things. One is: having women on a station improves the social environment. Second was that actually there's a lot of very smart science women out there and we are missing a trick if we don't employ them. And the third one was: actually having a mix of internal and university people is actually going to beneficial. Internally we have got some good people and some not so good people. No organisation is universally brilliant. Every organisation has good, mediocre and not so good people and we were no exception to that. Universities have good, not so good and mediocre people as well but if you can get the mix right, that's great. And lastly, I was also impressed by what students and post-docs brought, youngsters brought, so those all went into my consciousness and they all had an influence on the way I approached management when I got the chance to do it. I thought I acted on most of those and it was carrying through from experience that made me convinced that there were benefits we could bring. There was much about the Americans which I just found bizarre, off the wall, but there were many strengths to it. The trick is to pick the good bits and leave the bizarre bits aside.

[Part 2 0:40:28] Lee: Let's look at one or two of your seasons in a bit more detail, ones you have pointed out in your notes. One was effectively your first season, the 1971 winter at South Georgia where you said that the group, party, did not gel at all. In retrospect, can you find a reason for that?

Clarke: Yes. I'll phrase this carefully. It was down to the choice of base commander. It was the wrong choice of base commander in my view and we were all young, inexperienced. No-one had ever had to do a job like this before and it didn't work. It was thirteen in the wintering party I think and it evolved into twelve plus one and that is never good.

[Part 2 0:41:14] Lee: You mean twelve versus one?

Clarke: Yes. Twelve and one would be a better way. Occasionally versus but twelve and one would be a more honest way of putting it I think. There were occasions when it got very difficult. It was actually difficult for much of that winter and the party just never gelled socially or anything else. There were many aspects which I enjoyed, and the science, I was picking up a new science programme. That was going well, but at the time, it was my first winter and I remember thinking 'Mmm.' I remember toying with the idea of whether I would do a second winter. Then summer came along and it was great and the second winter turned out to be a major success.

[Part 2 0:41:57] Lee: In contrast, you put that down as one of your most memorable, 1972 at South Georgia.

Clarke: It was; it was absolutely terrific. We had a bigger party, 25 people maybe I think that winter, a good mix of people and we had another young naive base

commander, a guy called Jerry Tallowin, who was an exact contemporary of mine. I was the two winter marine person; Jerry two winter terrestrial person. He was a botanist. I still see Jerry; he hasn't changed at all. And he turned out to be really good. He handled it very very well and the base gelled and we did some terrific things and the morale at the end of the winter when the ship came in for relief was extremely high. We'd had a great winter and that was memorable. Lots of things had happened. All small things but you came away thinking that was a great time.

[Part 2 0:42:47] Lee: When you were establishing Rothera (I'm afraid I forget what year that was now but you will know) …

Clarke: '97. Well the switch … The last season at Signy was '94 but we didn't get in to Rothera until '97, so there was a hiatus in that sense.

[Part 2 0:43:03] Lee: What do you remember of that establishment of Rothera, about the difficulties and the things that went better than expected?

Clarke: It was actually a very positive experience all round I think. We had moved from an old, an ancient base with old labs to a brand new lab and it was terrific. We had space; it had a customised aquarium. We had an exciting new area to explore and it was a new area. It was far south. I felt I was in the genuine Antarctic. I was on the edge of Marguerite Bay which was an area that carried a mystique for Fids I think, as I guess you probably experienced. The Marguerite Bay community is a very distinct community within Fids because it was essentially the travelling community. That was where the dog sledging took place, so that Marguerite Bay community was a very distinct community and I loved the fact that I was on … I wasn't dog sledging but I was on the edge of Marguerite Bay. With the history of that area in BAS, that meant something to me. It probably didn't mean as much to other people; it meant something to me. That was great.

[Part 2 0:44:16] Clarke: The new lab was terrific. Having access to aircraft was terrific. I saw a whole side to BAS that I had only known about indirectly in committees and heard about. Suddenly I could experience what these guys did in the field. It meant also that I moved onto a multi-disciplinary base, so I shared the bar with glaciologists and geologists in a way that you didn't at Signy, because you were biology only at Signy. I think if you took the opportunity, it gave you an outlook that you didn't otherwise have, and I ended up socialising with engineers who look after aircraft, things like that. It broadened my experience in lots of ways so I loved it, and then the lab burned down and we had rebuild it.

[Part 2 0:45:02] Lee: That was my next question. The Bonner Lab burned down in September 2001, and how did you cope with that?

Clarke: Well the funny thing to say is that I have had three memorable phone calls in BAS. One of them involved Chris Rapley and I am not going to go into that one. The second one was to say the Bonner Lab is on fire. The third one was to tell me about Kirsty. Those two, the Bonner Lab and Kirsty, I took phone call at home and that was just … Well I rushed straight in to BAS. They said 'It is still alight. There is no one in there.' But under the circumstances, which I then learned about, we had to let it burn down. That was the only safe thing you could do.

[Part 2 0:45:56] Lee: This was 2001, so no telephones yet?

Clarke: No. Was there VOIP? I don't know the answer to that actually. I think it was satellite phones, but it wasn't VOIP (Voice over Internet Protocol) that we have now. It wasn't a question of picking up the phone and dialling.

[Part 2 0:46:16] Lee: You were getting the news as it was happening?

Clarke: Yes, so there must have been a phone call. Basically the base leader at the time rang and said 'The lab is on fire.' And that elicited the emergency response in NERC, and in BAS and in NERC; people came piling in to sort it out. But you can't sort out much from the Cambridge end except to ratify the decision to let it burn down, and basically say 'Do not go; this is the curtain. One kilometre or half a kilometre' (or whatever it was).

[Part 2 0:46:44] Lee: Was there a will amongst the Rothera team at that time to try and fight this fire?

Clarke: Oh yes, they did attempt to. There is fire-fighting truck for the aircraft. So they got the firefighting truck down the runway. The runway of course, at that time, was not in operation, because it was winter. So they had to get it down through snow and ice, and the problem was that the wind was so strong that the water wasn't actually landing on the base. It was being pumped into the air and then blown sideways, and you couldn't get the fire truck onto the other side of the landing … You had to do it from the other side of the airstrip. And the water simply wasn't reaching it. At that point they said, we can't fight the fire, and the order was given 'Back off, right back up to the main station. Watch it burn.' Because we knew as the fire moved down to the southern end of the building which was where the air compressor and bottles were, that there were going to be some loud bangs. And there were. In fact when one of the air bottles went off, the main base shook; that's half a kilometre away.

[Part 2 0:47:46] Lee: What involvement did you have in the replacement of that lab?

Clarke: That was interesting. Quite a lot. In my managerial capacity I was on the design team of Bonner Lab I and that meant my input was to say 'This is how we would like the lab laid out scientifically' and interact with the guys on the building side who would say 'That's great but we can't do that because … but how about this?' – that sort of interaction. But basically we got the lab we wanted. In the first year of operation we realised we got a couple of things wrong, small things, trivial things.

[Part 2 0:48:18] Lee: Such as?

Clarke: The placement of the labs, placement of the offices and the arrangement of the offices. It's small and psychological but critical. What we did was: there is a central main entrance which we thought was sensible and the idea was that you went into the main entrance and turned left for the dirty areas – that's the aquarium, the rough lab and the scuba – dirty and wet. And you turned right for the clean and dry areas. All the offices and dry laboratories were to the right. We actually started with

offices and then labs but that meant that half the offices looked out at the view and the other half of the offices looked at the slag heap which was the vertical face of the cliff from which the rock had been blasted to generate the runway. And actually that wasn't sensible. If you are going to ask people to winter for two winters, which at the time we were, and you were going to give them an office which was going to be their personal space, it was much more sensible to give the offices the view and the labs the view of the slag heap. That's when we designed Bonner Lab II. That's what we did and I went to the management guy, or the building guy, and said 'How about doing this?' He said 'Oh thank goodness you said that. That's great because I can put all the facilities down one side.' So from a structural point of view, he was ?? [inaudible]

[Part 2 0:49:35] Lee: So Bonner Lab II was post 2001?

Clarke: Yes, and it shows you the value of having political visitors. The season before it burned down, we had hosted Baroness Scotland, who at the time was in charge of the Foreign and Commonwealth Office and the elements that ran Antarctica. So she was the high ranking politician with responsibility for Antarctica. She came down and she was a total success. I was extremely impressed with her as a person and also impressed with the way that she dealt with the visit. She was one of the most impressive visitors we've had, as well as being a delightful individual, and she went away thoroughly impressed by what NERC … And Chris Rapley who was co-hosting it was part of that impression. He worked hard to give a good impression of BAS. We had a decision to rebuild the lab within days of the lab burning down, and that came, we believe, directly from Baroness Scotland. You never know how the wheels of power actually turn but we believe that she was instrumental in getting that. So we were able to start planning immediately to the rebuild and we were able to put in action some of the corrections to the minor elements of the building that we found on experience we got wrong. 90 percent of it we found was right. If you knew Bonner Lab I, you would walk in Bonner Lab II and know where almost everything was because it was exactly the same.

[Part 2 0:50:59] Lee: I couldn't help noticing that the library is called the Andy Clarke Library.

Clarke: Yeah.

[Part 2 0:51:04] Lee: How did that happen?

Clarke: It was my last season and there was a cohort of students and postdocs down there and Nick Owens was down for his what turned out to be his last visit down there, and I gave a science talk.

[Part 2 0:51:29] Lee: In the lab?

Clarke: No, I gave a science talk up in the bar actually. I made a point of every season I went down, I always gave a science talk because I wanted to explain to the guys in the station as a whole, what it was the Bonner Lab did, because the Bonner Lab was down the road and all the scientists go down there. A lot of construction crew or general support people don't feel happy going into the environment. It's not that they are unwelcome, it's just that they themselves don't feel it is appropriate for them to go

in the door. So I say 'Look, I just want to give you a simple talk as to what we are doing out there and why we are doing it.' I would give a half-hour talk in the bar. It was deliberately timed before dinner so people could have a beer while I am talking and then wander in, and if anyone's got any questions I was happy to answer them. It's a very generalised talk and I gave that. Then Nick gave a speech afterwards to say I was about to leave and said very nice things about me, and then it turned out that he had been down to talk to the students and postdocs and said 'Is there anything you would like to do?' And they said 'Yes, we would like to name the library.' And hence it happened. I was very touched actually and it was a complete surprise organised entirely at the grass roots level, so that was very touching.

[Part 2 0:52:42] Lee: In the summer of 2004/5 at Rothera alcohol became a problem. Can you talk me through this please. Not for you personally I suppose?

Clarke: I hope not.

[Part 2 0:52:55] Lee: In case I gave the wrong impression there.

Clarke: Well I am sure in my time at South Georgia, as all 20-year olds do, I probably had my moments, but I think one of the problems that we have to deal with managerially as an organisation is the fact that we employ a lot of young people and they bring with them lifestyle and the approach to life that is characteristic of UK as a whole. So where social patterns change in UK as a whole, they change in Antarctica. One of the things that has changed in the UK, and has hence impacted on Antarctica, is a change in the approach to alcohol. At South Georgia in the '70s … This sounds like the classic 'When I was a lad … ' talk but you need to set it in context. It was not unusual to have a can of beer for lunch.

[Part 2 0:53:58] Clarke: Quite a lot of people would come up to lunch in the main building, in Shackleton House, go in the bar, take a single can of beer, take it through and have a beer with their lunch. They would have a cup of coffee afterwards. They may fall asleep in the chair because they have got a one hour lunch break or whatever, and then they would go back and carry on. And in the evenings they might have a beer or two in the bar. Then Saturday nights there would generally be a bar night, which meant that more beer was drunk, and on Saturday night occasionally some people were a little the worse for wear. I never saw in my time, in two years at South Georgia, anyone on the BAS side completely out of it with alcohol. There were people who would go to bed merry and maybe just a little bit more than merry, but nothing that I would regard as anything other than the odd night where you are going to have a headache in the morning.

[Part 2 0:54:48] Clarke: I have seen Russian seamen, visiting, going home very much the worse for wear and that has changed now and the shift is where it is now unheard of for people to have alcohol at lunchtime; it's just unheard of, and with that is also a tendency to view the evening as drinking time. So with that have come a number of other changes. For example, when we first went to the Bonner Lab, it was not unusual for almost the entire lab to go back down the road after dinner. That meant putting your outer gear on again because you have got to walk down the road, and go into the lab. Maybe if it was the Marine Assistant or the one of the technicians, he or she might actually be doing emails or organising photographs, but the default was you

went back down to the lab. Then maybe around 9 or 10 o'clock you went up to the bar and had a drink at the end of the day, a nightcap or whatever it might be.

[Part 2 0:55:45] Clarke: That has changed now. There is now very much a perception that if you go down to the lab in the evening, you are actually not looking after the social life of the station, and the social life of the station is to get drunk in the bar in the evenings, and not all of us necessarily want to do that. Some of us don't want to do it because we have got older but there are also some younger people who don't want to do it either. So that change in the approach to alcohol is a UK-wide shift and it has its impact on the stations because it's basically that you get drunk in the evenings. BAS has tried all manners of ways to try and control, regulate, influence that and none of them have really been successful in my view. But we do have odd years when it causes a real problem and that season was one of them.

[Part 2 0:56:32] Lee: So describe the problem.

Clarke: One individual, who had come to the end of their second winter, was ready to go home. There was a well-known saying that there are some people who do their third summer, are happy to do it and leave at the end of it having had a good summer. There are some people who need to be shifted home on the first available flight or ship out because they have come to the end of their time. And if you are in that position and you are not going home, then alcohol is one of the ways that people take to relieve whatever tensions and pressures they have. We had an individual who was using alcohol in that way and was getting riotously drunk most evenings but was also doing it in a way that pulled other people in so that there was a gradually increasing corpus of people, mainly on the construction and support side in this case (it isn't always the case but in this case it was) who were often unfit for work the next morning and I just felt that was not right, as did the people on the base at the time.

[Part 2 0:57:41] Lee: The base commander, again pointing at no individuals, found it difficult to control that? He had no sanctions?

Clarke: Yes. He had no sanctions. Actually it turned out that this was a seminal event because I, as the senior scientist and a member of the Director's Committee at the time, automatically helped out with the management board for the station. The station was so complicated that we had a little management committee that would meet to decide things. It was often only a half hour meeting but it was good. I represented both the science lab and also to some extent HQ in that meeting and I had some long heart-to-hearts with the base commander at the time who was a good friend, and we said 'We have to ship this guy out.' It's not an easy decision to make. The base commander at the time felt this was a last resort.

[Part 2 0:58:31] Clarke: He had never ever, in a long period of time at BAS, ever shipped anybody out, and decided this one had to go and he transmitted that, with my support and documentation and everything else we did – it was all above board – we transmitted it back to the UK and it was countermanded on the grounds that there wasn't the right sequence of verbal and written warnings and everything else. So if it was challenged, BAS, the people back home, might actually get hauled into a tribunal and be found wanting and so basically they were covering their backsides and this individual stayed and caused enormous disruption. The base commander in question

left BAS soon afterwards for a number of reasons of which that lack of support, I happen to know, was the critical one because I spoke with him several times over coffees and quietly and I know. So it was very unsatisfactory all round and it was part also of …

[Part 2 0:59:27] Clarke: There were lots of factors involved in that season but one of them was: by then we had another member of the senior management board who had very little experience of or interest in going South, and so I don't think appreciated the nature of the problem we were dealing with and was only interested in it from a UK legal perspective rather than a social and work perspective. I will give you another incident, not from that season, but another one which staggered me which also surrounds alcohol to give you an illustration of the sort of problems, and I am deliberately not going to use names here because I don't think it is appropriate. But we did have a visit from a member of UK staff, who came down for the season and *James Clark Ross* was coming in. She was coming in late because of ice. There was a rapid turn round needed and Jerry[2] was the ship's master at the time, someone whom I got on with very well, very respectful. I'm not sure I would like to work for him but I got on very well with him. Superb supporter of scientists at sea, the best possible Master you could want in charge of a ship that you that were using for science.

[Part 2 1:00:41] Lee: Jerry?

Clarke: Ah now.

[Part 2 1:00:44] Lee: OK it doesn't matter.

Clarke: The name's gone. It may come back to me later. The ship radio-ed in to say 'We are going to be in Sunday morning probably around five o'clock in the morning. Can you have the mooring crew ready because we need a rapid turn-round? We are behind schedule already. We have got to pump oil. We have got to discharge cargo and we need to be off as soon as possible, but we are going to have a social event and we are going to beat you at football again.' But within the terms of a normal visit, this was 'We need to get going immediately.' So we had the management committee round. This was a different base commander at the time, subsequent to that incident we were talking about before, and we had a meeting and I vividly remember this visiting member of HQ staff saying 'They can't come in tomorrow morning.' We said 'Why is that?' They said 'It's my birthday and I won't be in a fit state to do anything technical the next morning.' And we just looked at each other.

[Part 2 1:01:46] Clarke: Outside the confines of the meeting I went up to the base commander and said 'I don't believe I heard that.' He said 'No, I don't either.' So he called Jerry and said 'We have had a slight reaction on this, but please do come in.' Jerry's reaction was 'In which case, I am coming in, at bloody five o'clock.' He speeded up the ship to get it in early, just to make the point and the guys were there. That guy was out there but he wasn't actually very with it. I remember thinking 'This used to be a professional organisation. Maybe not everyone thinks of it in the same way.' It was an isolated incident but again it surrounds alcohol and an approach. 'This is my birthday, therefore I am going to get drunk, therefore I can't … ' 'Do you know

[2] Captain Jerry Burgan.

how much it costs to run a research vessel?' It was an interesting insight into some of the problems we sometimes have to deal with, but I must emphasise those are isolated instances but I have used them as examples of a trend that BAS has to deal with. It's the outside coming in.

[Part 2 1:02:50] Lee: I am surprised you are talking about the 21st century. I can imagine that in the Heroic Era, '60s and so on, but I am surprised, partly surprised because I attended the Girton conference in 2009, I think it would have been, and I was surprised then that some very senior woman from BAS stood up in front of everybody and said 'I am going to talk to you about alcohol' and gave a ten-minute lecture on not getting drunk in the Antarctic. 'It can cost you your life.' And we all went 'Hmm! It could.'

Clarke: And it has. Not in BAS to my knowledge, but I do know of cases in the American zone where it has. Yes. The trouble is that those lectures and admonitions actually are forgotten about by the time you get down and BAS does have an alcohol policy and it tries its best to make it work. But you are up against a lot of difficulties in … People like their freedom and there are ways round every regulation as people will know.

[Part 2 1:04:02] Lee: I'm very conscious that we have a luncheon booked any moment now, so let's stop for the time being.

Clarke: OK, right.

[Part 2 1:04:08] [End of Part Two]

Part Three

[Part 3 0:00:00] Lee: This is Andy Clarke, interviewed by Chris Eldon Lee, on the 17th of October 2012. Andy Clarke, Part 3.

[Part 3 0:00:10] Lee: You were going to tell me over lunch an amusing story.

Clarke: Basketball? Yes, well for many years BAS ran an informal Sunday morning football side and for about a decade I ran it and we needed some strip. So it was decided in about 1982, and the date is significant, we would get some new strip, and in conjunction with a colleague who was also on the team, Geoff Renner, who had access to a supplier of cheap sports kit, we ordered some. I went into a catalogue, ordered the strip and it was ready for the first game of the '82/'83 season I think, and we traditionally played the Cavendish Laboratory in our opening fixture, which we did on Trinity's ground and we all wandered out of the away team's in our new strip. And the first question I received is 'Why is a team from the British Antarctic Survey dressed in the Argentine national football strip? Pale blue and white stripes with dark blue edgings. 'So that was why they were cheap!' This was of course the first season after the Falklands Conflict, and there was BAS playing in Argentine national strip. We simply hadn't realised. We just picked it out. It wasn't even labelled national. We just picked it out of a colour brochure and said 'We can get those. We will have those.' And we never lived it down.

[Part 3 0:01:42] Lee: Have you ever played football in the Antarctic?

Clarke: Yes we did. South Georgia of course had a football pitch at the back of the whaling station and we played on that, and we played usually visiting ships. There was never much interest in having a game internally within the team on the station. What we did do on some occasions was play three-a-side football and/or badminton, obviously not at the same time, in the old cinema in the Grytviken whaling station when that was still standing. And in one memorable occasion at the end of one season in the early '70s we had a three-a-side football competition with teams drawn at random from the scientists and support on the base and the crew and officers of the *John Biscoe*. I think we were enough to get four or eight teams or something and play short 5-minute games and a knockout.

[Part 3 0:02:29] Clarke: The cinema there had an upper storey, a balcony for where the senior members of the whaling station would be during a film show, and we got a buffet going up there and a bar. The chef on the ship produced a buffet and the base produced the drink and everyone socialised up top whilst a rotation of football games was played and all of the teams were drawn at random from a pool. So you might have a ship's officer, a crewman and a scientist all on the one side. That was a very good social evening. We played against visiting Russian ships. We played against *HMS Endurance* etc. and I suppose the most memorable occasion was a Russian support vessel came in and at that time there was a huge Russian fishing fleet in the area and although the trawlers never came in for water, the support vessels and the research vessels would sometimes come in for water. Research vessels in loose terminology; they were often bristling with aerials and satellite receivers.

[Part 3 0:03:26] Clarke: But one of them did come in and we challenged them to a game of football. We played and the Russians turned out in anything they had available. They were staggered to see us turning out in full football strip, black and white. We had West Bromwich Albion strip at the time I remember: black and white stripes. We played and beat them six-nil or something and then there was a very good party in the evening. The next year the ship came back and came and said 'We challenge you to a football game.' 'Oh yes OK.' And they then turned out in full Russian national strip with CCCP across them and beat us three–two, and we think they had gone round the entire fleet and got the best football as they could off them, put them together, sent them in and said 'Beat the British.' And we had a very good party afterwards.

[Part 3 0:04:12] Lee: And cricket?

Clarke: Cricket has been played in the Antarctic but I have never played it. There wasn't a tradition of playing cricket at South Georgia particularly but cricket has been played on snow. But we never got enough snow of the right sort to ever play cricket at South Georgia. Other people I know have. At Shackleton House we could play badminton inside and we could play table tennis inside and they were the major occupations.

[Part 3 0:04:38] Lee: You talked about the internal structure of the Bonner Laboratory and the moving of partitions and so on. You haven't talked about the equipment. Were you responsible for ordering the equipment for the Bonner Laboratory?

Clarke: My influence was really overall design of the lab, in particular laying down the criteria we needed for the aquarium which was the most specialist part of the building and the most important because we wanted to make sure we could keep the animals in good condition after they come in from the sea and that led us to a few problems because what we wanted to do was technically quite difficult to do.

[Part 3 0:05:16] Lee: What do you mean?

Clarke: Well one of the things that happens is, surprisingly, in an Antarctic aquarium we have learned by experience that it is best not to cool the water, but to cool the air and let the air cool the water. The reason that you don't cool the water very often is that most cooling units have a refrigerating unit and a heating unit backed off against each other and if anything goes wrong, it's always the cooling unit that goes wrong and so you can inadvertently cook everything in the tanks. So it is much better to cool the air and let that slowly cool the water which is what we do in the UK. Of course the water in the aquarium in the Antarctic is already cold so it is just a question of cooling the air but almost any cooler you buy will rust rapidly and decay in the salt water atmosphere in the aquarium.

[Part 3 0:06:04] Clarke: So what we stipulated was that we wanted the air cooling to be external to the aquarium and just cold air ducted in. That would extend the life of the cooling units and we also wanted our header tank for the water to be outside the lab but cool. It turned out that both these were difficult to achieve technically and so the design was unilaterally changed without reference to the science spec and it led to a slight difference of opinion at the design committee because this was only discovered when it was too late to be put right. And we have now had to replace all of the coolers in the Bonner Lab aquarium exactly as expected but that's the way life goes on.

[Part 3 0:06:44] Lee: But were you able to get cutting edge equipment for that lab?

Clarke: Yes, we were. I refer back to a comment I made earlier which is there is always this decision about taking equipment to the Antarctic to meet the animals or taking the animals back to the UK to meet the equipment and we still do both. We have an aquarium in the UK and an aquarium in the Antarctic, and whether the equipment travels South or whether the equipment stays North is very much dependent of the size of the equipment, its expense and how frequently it needs calibration or technical support etc. So there is a technical decision but within those limitations, we can get some very modern equipment down to the Antarctic and do.

[Part 3 0:07:24] Lee: You were at the front of two or three initiatives in the Antarctic, as I understand it. One was, you were one of the leaders of the move to understand biodiversity patterns in the Antarctic. Was this your own invention, this area of study, or were you picking it up from somebody else?

Clarke: Nothing ever springs suddenly into the brain. I was the first person probably to really start doing this sort of work in Antarctica and the reason that I got interested in it was because I had been exposed to some of this sort of work in northern areas and around the UK, often a terrestrial experience. I could see from my experience as

an amateur birder how ecology and mapping of biology had gone apace and I just felt that the marine environment in general and the marine work in the Antarctic were well behind what was being done elsewhere. And so it became an interest of mine to develop that idea, so it was me that started that development in the Antarctic but it was based on experiences I'd had elsewhere. And now that work is carried on by others. We set some databases going and actually I wasn't responsible for erecting the most powerful database we use. That was done by a colleague but I was, I think, fairly instrumental in some of the analytic approaches we use and I am now behind the game line on that too because that had been taken up by younger dynamic people and they are rushing the stuff forward. But I had some pleasure in setting the field going.

[Part 3 0:08:54] Lee: One of Inigo's question is 'The development of your science programmes required some complex analytical equipment. What were the key challenges in obtaining and running those items?'

Clarke: That is an interesting question. Analytical equipment is never cheap and so there is always a challenge in getting the money together. That is very often a key challenge. That might mean raising the money from an external source or raiding other sources if you are in control of the budget, which for a long time I was. One could choose to deploy money into one area rather than another. So you could choose to buy an expensive echo sounder on the one hand or invest in geolocator tags for the bird people, or buy a piece of equipment for analysis in the Bonner Lab. Those decisions were in the end mine but we used to take them in a fairly collegiate manner and I believed in open and transparent financial management. So when it came to the annual budget, I would ask people what they wanted and I used to show them two budgets when it came to the decision.

[Part 3 0:10:01] Clarke: I would show them the budget which had everything that people had asked for and they could see the bottom line that they were needing five times as much money as we had available, and then they would see my suggestions, and they would be time-based suggestions. 'We will get this this year but we will slip that to next year.' And then we would have a debate. Some people were happy to wait for their equipment; other people were less happy to wait for their equipment, but I think everybody recognised that there were decisions to be made. There wasn't an inexhaustible supply of money.

[Part 3 0:10:29] Lee: You had to build your own laboratory at King Edward Point when you first arrived, didn't you? There was nothing provided?

Clarke: Yes I did. That's true. I did it with Inigo, my supervisor.

[Part 3 0:10:40] Lee: Were you expecting to be left anything?

Clarke: Yes, we knew beforehand what the job was. When we went in, Inigo had already pre-warned me. 'Our first job is to build the lab.' What I wasn't expecting was that our first job for building the aquarium was to remove all the coal, because the room we chose for the aquarium was actually the coal-house for the heating unit for Discovery House, so we had to clean that up and that was a messy job. At the time … I look back now and think 'Did we really do that?' I think the answer was 'That's

where the aquarium is going. There's coal in it. We have to shift it out.' And you did it.

[Part 3 0:11:12] Lee: It's what Fids do, isn't it?

Clarke: It's what Fids do. As for building the lab, the first one we largely built ourselves, with help from a carpenter, but it was already recognised that that was an interim lab and we were going to move the lab, the dry aspect of the lab, not the aquarium. We would move the dry aspect of the lab up to Shackleton House, the main living quarters, but the room wasn't ready yet because priority had rightly been given to getting the dining room, the kitchen and the lounge all sorted, and putting some new labs in Shackleton House was the second place project. So we lived in the lab in Discovery House for a year and then moved up to Shackleton House for the final year and a half, and the new labs were built by a carpenter, who then presented me with a paint brush and paint pot and said 'Right, I built it; you can paint it' which was fair enough.

[Part 3 0:11:56] Lee: What particular skills did you bring with you to KEP from the UK? And what skills did you have to learn by the seat of your pants as you went along?

Clarke: The answer to the first question is probably none at all.

[Part 3 0:12:09] Lee: I think that's probably what I was expecting, so what did you gain from your first couple of years?

Clarke: An inordinate amount, some of it practical, some of it psychological. I'd had a standard upbringing: I went to school; I went to university. None of that involved using my hands particularly, and although I had done camping and been outdoors and was fairly happy in the outdoor world, I wasn't a climber or anything like that. So I brought intellectual skills with me but very little in the way of practical skills. I can look back and say my three years at university were terrific and I developed intellectually hugely at that time. That was followed by three years in the Antarctic when I changed as a person much more because I had to deal with … It so happened that most of the people on the support side were much older than myself. These were old FIDS hands, long established, done seasons at other bases. Famous names from that era like Dave Hill, Golly Gallsworthy, Dad Etchells, Al Smith, Ricky Chinn.

[Part 3 0:13:20] Clarke: That was the cohort that was the cohort before me. That was a generation we revered and looked up to because they had been there and done it all. But they were very very tolerant at green hands coming in. They took the mickey out of you but, as an example, I had to build a trawl. That means a metal frame. I went in to Inigo to see the engineering guy Dad Etchells and he said 'Right, there it is', pointed me at the bench and said 'There's the flat iron; there's the equipment; use it; give us a shout if you reach a problem.' He left me to it. So I had to ask for advice as to how to do it, and I got that advice, and then I was left to myself. So you learned a lot and in the winter we had no boatman, so I had to look after the boats. I had never been in a boat prior to going South before. Here I was having to slip the boat, strip it down, clean it up, re-caulk it, repaint it and re-launch it. So you learned a lot practically and I think now that happens less, because now of course all those jobs are

assigned to people, and for various reasons, legal, Health & Safety whatever, the scientist doesn't go into the lab, or into the engineering workshop. The engineer builds it for him and delivers it and that is another change.

[Part 3 0:14:30] Lee: You have mentioned one or two characters there. Here are some more that Lloyd Peck wants me to ask you about. Robin Ross and Langdon Quentin?

Clarke: Ah, Langdon and Robin. Langdon Quentin and Robin Ross are actually a husband and wife team. They are delightful people. They probably were the leading lights in krill work at about the time I came into the field. They started slightly behind Inigo and myself but they rapidly became the leading figures in the research. They put a huge amount of work into the field and they probably know more about Antarctic krill than any other one person. We think of them as Langdon and Robin – one person. In fact they are utterly different. Langdon is Californian and Robin is from the East Coast but they worked as a couple. They were my hosts at Palmer Station in 1984, so I got to know them at a meeting in Wilmington, North Carolina, in the early '80s.

[Part 3 0:15:30] Clarke: We got on very well personally and they became very good friends and so we've visited then in the States and they have stayed with us in Cambridge, as well as being close colleagues for a long time. They hosted, as I say, the trip to Palmer in 1984. We did some really interesting and enjoyable work on krill at the time and that was actually a return to what I was originally supposed to be working on. But at that stage Palmer Station had the facilities that let me do that and I did some work that I still feel quite pleased when we did there. They stayed very good friends. They too have retired, largely, now so we stay in personal contact. We don't work together any more but they were very good friends and colleagues for a large time of my period in the Antarctic.

[Part 3 0:16:11] Lee: John Morris and Paul Tyler?

Clarke: Ah, right. Paul Tyler I met … I will deal with Paul first. Paul is just retired from being Professor of Deep Sea Biology in the University of Southampton and we knew of each other for a while before we met and it so happened that in 1983 he wrote a really seminal paper (I think it was '83) on seasonality in the deep sea. And I wrote a paper on seasonality in the Antarctic, and then we met and we got on really well and we have been very close personal friends and also worked together ever since. He now has retired as well so it has been a long period of collaboration. I managed to get Paul to do a season in the Antarctic, not in return but I also have done time on Paul's cruises because he is the person running the Deep Sea ROV out of Southampton. He was one of the two people who bid for the money and got it, and he is one of the major users of it. So I have been on cruises with Paul. He is a good friend.

[Part 3 0:17:24] Lee: So what is a Tylerette, then?

Clarke: [Laughs] Yes, well I talked about my approach to appointing women to work in the Antarctic. Paul is notorious, famous however you want, for almost all of his research students being women and he is an outstanding teacher and is a superb supervisor of students. I was unable to attend Paul's 60th birthday party because I was

actually in the Antarctic at the time, but all his research students turned out and there is a photograph of them and most of them are women, but all of them came back for his 60th birthday which says something about Paul. The Tylerettes is a group name for his students most of which are female.

[Part 3 0:18:14] Lee: So were there any Clarkettes because there is a hint here that perhaps you also started to employ women, sometimes blonde women?

Clarke: There is a hint of that. I would deny it absolutely but actually the facts are against me. Yes, on a serious note it wasn't actually a process of positive discrimination because I don't actually believe in that, but once we had opened the gates, we encouraged people to apply and for a period of time, the best people we interviewed on the day were always women. I got this reputation.

[Part 3 0:18:49] Lee: There was a backlog I guess?

Clarke: I guess so. Yes and also we had opened the door on people who we were keen to see incoming and I appointed a stream and then promptly got a reputation for it to the extent that when a young lady, blonde, walks through the canteen, the comment is made 'I suppose Clarke appointed that one' even if they were a visitor.

[Part 3 0:19:07] Lee: OK.

Clarke: I have to say that Lloyd has not been backward in following my steps either.

[Part 3 0:19:11] Lee: OK. We will come to John Morris in a moment but you mentioned about seasonality in the Antarctic and as you talked a bit earlier I read your notes about being at the forefront of biochemical and physiological adaptation to low temperatures, and you talk about the surprise at the seasonal growth rate of krill, I think it was, even though the temperatures really didn't change very much.

Clarke: Yes, that was the interesting problem that confronted me. I guess if you are thinking about the animals or plants, if you are a biologist, then you need to be thinking about them in context, and there is a lovely biography of a little known genetics person, who got the Nobel Prize, called Barbara McClintock. She worked on maize genes and she discovered what are usually called jumping genes and she was a most interesting character, reclusive and there is a wonderful biography written of her and it is entitled *A Feeling for the Organism* and the title was deliberate because the thesis that the biographer was promoting was that the reason that Barbara McClintock found jumping genes and not many other people was that she had a feeling for maize as an organism. And I know a colleague of mine in the Antarctic, who works on Adelie penguins, and I would use the same phrase of him. He has a feeling for what an Adelie penguin might do or does in a way that very few other people I know have.

[Part 3 0:20:43] Clarke: I think it is an underrated aspect of being a biologist. You need to have a feel for what's going on and when I first started at South Georgia, I wanted to know why these guys were growing slowly. I felt that the traditional explanation, that they were simply cold, didn't wash. It turned out I was wrong. It is actually largely because it's cold, but in getting to that step, I went on a circuitous route and it made me think about lots of other things and opened up other avenues.

Eventually I persuaded myself that the explanation is complicated but the cold water is actually a key feature of it but what was stimulating a lot of the work was this tension between … It's a highly seasonal environment but the temperature doesn't change very much. So it's the food that's seasonal and the light that's seasonal and the light generates the food because plants need light. And that was the tension that I followed for a long time and Paul Tyler (to go back to Paul) was interested in the same features because he was discovering in these animals living in the depths of the ocean 3000 metres, 4000 metres down, that some of those were seasonal, and there was absolutely no seasonality of temperature or light and it was food.

[Part 3 0:21:59] Clarke: In his case it was the phytodetrital pulse to the sea bed, and that is one of our fundamental revolutions in our understanding of the oceans, was that recognition that the seasonal signal from the surface reaches the deepest waters. Paul was at the forefront of that. And I was wrestling with a parallel but different problem in the Antarctic which is partly why Paul and I got on so well. We were wrestling with similar problems in many ways, and I was the right guy in the right place. It happened to be in a fertile area; relatively few people had worked in it. The ones who had I thought hadn't got it quite right, but then every scientist thinks that and it drove the rest of my science career and what stayed with me was an interest in temperature. That is what really underpins everything I do. I am interested in the relationship between animals and temperature, or organisms and temperature, because I do plants too.

[Part 3 0:22:48] Lee: John Morris, who was he?

Clarke: Ah, John was someone I met in the late '70s and he worked for a small NERC institute which was also in Cambridge, long shut, and it was concerned with cryopreservation, preserving cell lines in liquid nitrogen, or whatever cooling ways and how you went about that. At the time it was recognised that that was potentially an enormously important technique but it hadn't been cracked. For example at that stage they couldn't freeze blood and so if there was an accident, you needed people to come and give blood because you could not store blood for any length of time. Now you can, so that problem had been cracked. It's a deep freeze problem. John and I met, I can't remember how, but we got interested in solving some problems. We just enjoyed working together. This was work that was outwith my main BAS work but BAS were very tolerant about me doing it because it was generating publications, I was interested in it and we got on. We also became very close personal friends and have remained so, and we have actually got a paper which is under review at the moment which we think is going to be quite important but we don't know. We still work together but … John is someone I have worked with but primarily is just a close personal friend.

[Part 3 0:24:12] Lee: Can you hint at why it might be important?

Clarke: We think we have identified a low temperature limit for life. That needs a bit of further explanation because things will survive down to almost absolute zero, under the right circumstances, but if your regard life as completing a life cycle, in other words going from adult to adult, or egg to egg depending on how you do it, we think there is a low limit beyond which you cannot complete your life cycle. Which means that unless you come above that limit seasonally, you can't live, and that limit is

around –25. We have got technical reasons and we have done some experiments to back it up and the paper is under review at the moment. So we will see what the referees think, and if we do, then it has ramifications for a lot of things like Life on Mars and other such things. So it will stir a few people up if it gets to publication, but because it is slightly controversial, we are not expecting a smooth ride to publication, but it's fun. We think we are right but then as I said a minute ago, scientists always do.

[Part 3 0:25:17] Lee: What is 'bang powder?'

Clarke: Oh my goodness yes. Bang powder is a name, I don't know how widespread it is, but it is a name applied to a compound of nitrogen triiodide. It is made by dripping iodine into liquid ammonia or ammonia solution. It is a well-known feature of my supervisor, Inigo Everson, who used to make it. When carefully crystallised off, it looks a bit like cigarette ash but is explosive on being touched. So Inigo used to make it for various practical joking effects and on one occasion made some and applied to my wellington boots. So as I put them on and walked down the corridor, couldn't work out why each footfall was accompanied by a loud bang and clouds of purple smoke.

[Part 3 0:26:14] Clarke: We did at the time have a problem with smoking in the … We had a coffee room in Discovery House and at that time lots of people smoked. In fact at that time cigarettes were still issued by BAS. That has changed. We felt that as half the people or more than half the people didn't smoke, and didn't really like cigarette smoke, we were trying to encourage the smokers not to smoke in the coffee room while other people were there. And Inigo did this at one stage by piling the ashtray with bang powder so when the first instance of a cigarette was stubbed out, then there was a very loud bang. The gentleman in question, who is sadly no longer with us, was Scots and there was a stream of expletives in Scottish which carried on for some time. So yes, I think I know where that question came from.

[Part 3 0:27:01] Lee: Finally, should you actually have done geology instead, or did you make the right decision?

Clarke: I made the right decision but the caveat to that is: I sort of still do bits of it. One of the other streams of work that I am still doing, is on the evolutionary history of the fauna. I do that in collaboration with a palaeontologist colleague. So in essence I still do it, by proxy and I think I wouldn't have ended up doing that if it hadn't been for the fact that I have got soft spot for geology anyway and if you glance up there you will see a line of books about dinosaurs. I have got a paper on dinosaurs currently under review so I do sort of dabble in it in the fringes. Having had that mixed training has actually affected what I do and how I do it, but I don't think I did the wrong thing. I have enjoyed what I have done immensely. I don't know; if you replay the tape (to use the metaphor) and start me off as a geologist I'm quite certain I would enjoy that too. I wouldn't necessarily have been in the Antarctic. Who knows?

[Part 3 0:28:11] Lee: Thank you very much indeed, Andy.

Clarke: Right, my pleasure.

[Part 3 0:28:16] [End of Part Three]

ENDS

Possible extracts:

- [Part 1 0:17:11] The BAS medical with Colonel Hayward.
- [Part 1 0:22:22] Interviewing a female student.
- [Part 1 0:26:26] The new Ladies toilet at Signy.
- [Part 1 0:37:35] Samples thrown off the ship.
- [Part 1 0:44:10] Decision to return for another summer.
- [Part 1 0:45:03] Two freezer incidents.
- [Part 1 0:47:51] ROVs.
- [Part 1 0:52:10] Black Smokers.
- [Part 1 0:55:47] Operating an ROV.
- [Part 1 0:57:58] New species round Black Smokers.
- [Part 2 0:00:10] Health & Safety was non-existent.
- [Part 2 0:02:36] The Kirsty Brown incident.
- [Part 2 0:06:24] Three men lost on sea ice at Faraday.
- [Part 2 0:24:46] The problem with NERC.
- [Part 2 0:28:27] Coming into the scientific mainstream.
- [Part 2 0:31:48] A different approach in America.
- [Part 2 0:34:09] A scary incident at South Georgia.
- [Part 2 0:36:40] Pregnancy testing kits but no condoms.
- [Part 2 0:46:44] The Bonner Lab burned down.
- [Part 2 0:49:35] Baroness Scotland a delightful visitor.
- [Part 2 0:51:29] The Andy Clarke Library.
- [Part 2 0:53:58] Changing attitudes to alcohol.
- [Part 3 0:00:10] An embarrassing choice of football strip.
- [Part 3 0:05:16] Aquaria: cool the air not the water.
- [Part 3 0:13:20] Learning to be stand-in boatman.
- [Part 3 0:25:17] 'Bang powder'.