

JOANNA THIRSK (TALK)

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Speaker (JT): Joanna Thirsk | SANAE 48 | Medical doctor
Q1- Q13: Audience members
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A: I'd just like to start with a brief video clip, just to give you some idea of a little history of the SANAE program.

Video soundtrack: *"A vast white wilderness, stretches across the south of our planet; a giant natural laboratory that has long occupied the human psyche. Antarctica is a continent of remote natural wonder. For brief moments each year, this hauntingly beautiful landscape opens up, beckoning scientists and explorers from around the world to investigate its frozen secrets. Cape Town, the southern tip of Africa, has been a spring board for Antarctic exploration for over two hundred years. At the start of every summer, expedition's teams prepare for their trips south and bid farewell to Cape Town's shiny shores, embarking on an ocean journey of almost 4,500 km. Every year, the sound of [indiscernible] leaves the overwintering team that has braved the stark Antarctic winter. On board the SA Agulhas is a diverse team of scientists and logistical staff that will spend three months maintaining the base and researching polar science. This expedition falls within the fourth International Polar Year, an internationally coordinated scientific program that celebrates the importance of polar science and for the first time is being carried out against the backdrop of climate change. This year, over 10,000 scientists from more than 60 countries will be participating. It's a gruelling trip that can take up to three weeks across the world's wildest seas. Scientists and mariners vie for the chance to experience the Antarctic journey.*

'I grew up in Limpopo, you know. As a kid, running around, tending to goats and cattle' ... "

JT: Okay, so that just gave you a little brief introduction to what it's like to go down to Antarctica aboard the SA Agulhas, which is the research vessel.

The program is run by the South African National Antarctic Program, and we've just celebrated our 50th year of overwintering in Antarctica. And currently, next year, the trip that will go down is the SANAE 50 expedition. SANAE refers to the South African National Antarctic Expedition, so if I use that term, then you understand what that means.

So, just to give you a brief introduction about who I am and where I come from ... I was here at UCT from 2000 to 2005, and I was at medical school, so I did the 6-year MDChB. And after that I did my internship at the Baragwanath Hospital in Johannesburg. And then I came back down to Cape Town to fulfil a bursary obligation and I worked in various hospitals around Cape Town, and also spent a year at Groote Schuur, at the trauma unit there. And subsequent to that, I decided, well, you've worked for such a long time; you've done six years of studying; often you come straight from school, and a lot of people don't really know what they want to do with their life – they, come out of school and go straight to varsity. Some people take gap years – and I do encourage that; I think that's a very good idea, to take a gap year if you don't know what you want to do. And yes, so I felt that I'd worked for such a long time non-stop, and I just needed to see something different, experience something, you know, just away from medicine. And obviously you've trained for this amount of time; you want to still do something related to your career. So, through a friend of mine who did the expedition prior to me, I read and learned a lot more about this great continent, which not a lot of people know about, at the bottom of our planet. And it was great that there was an opportunity to go and be the doctor and spend a whole year there looking after the team and also looking after the summer personnel that come down there for the summer to engage in scientific experiments, to restock the base ... There were many different positions available there, and just one of them is being a doctor. But if you are an engineer or engaging in the other scientific endeavours you know, then there's equal opportunity for you to go down there.

So, I just want to share with you a quote which sums up the continent of Antarctica I think quite well and says: "If Antarctica were music, it would be Mozart; art and it would be Michelangelo; literature and it would be Shakespeare. And yet, it is something even greater; the only place on earth that is still as it should be. May we never tame it?" And you know, I think, as much as there is tourism that is going down to Antarctica now; it is still just really the last wilderness on this planet. With all our overpopulation and craziness that's going on, this is really an untouched place. And it's also ... because it's so untouched, it is so fragile to outside exploitation, and obviously everything that we do on this planet has an effect on its fragile environment.

Just to share with you: Antarctica has 70% of the world's fresh water, of our planet. It's one and a half times bigger than the United States. The continent actually doubles in size in the winter, so the ice forms and actually spreads halfway to Cape Town during the winter; so there's no way in, there's no way out during the winter. And actually being on the continent is analogous to being on a space station, but yet they actually say that there's more chance of being rescued from a space station up in space, than being rescued from Antarctica during the winter. So it's quite a scary place to be. You know that there's not much help, and you do take your life into your own hands. And people have died in their endeavours,

and I actually lost a team member on my trip down, so I would like to dedicate this talk in memory of him.

Okay, so, this is a little bit about my journey to the bottom of the world. And as you saw earlier, the red ship, the Agulhas, which is parked near the Waterfront, or moored near the Waterfront, and you're welcome to go and see it anytime. At the moment, she's on an expedition to Marion Island, which is also part of our program. The South African National Antarctic Program has research stations both on Antarctica, on the mainland, as well as on Gough Island and Marion Island, which are sub-Antarctic islands. Marion Island is about halfway between here and Antarctica, and also very very important to our understanding of Antarctica and global warming in general, and all the things related to that.

Okay, so the trip that I was on was the 48th National Antarctic Expedition, and I left in December of 2008, and I arrived back this year, at the end of February 2010. So all in all it was about 14 months away. Okay, so why Antarctica? Well, Antarctica is just ... It provides us with such a wealth of scientific knowledge, and as I said, it's a very untouched wilderness. It gives us exposure to studying obviously a large variety of wildlife that can survive there; not in the true centre of the continent, but around the coastline. So you'll get your seals, you'll get your penguins. But then there are also smaller life forms: the wingless midge is the only land-based animal, insect – tiny; very small, about 1.5 cm – that lives there. Otherwise it does not support any life. There's no native population of people that live on the continent. In the summer, there are about 4,000 people throughout the whole continent, and in winter it drops to about 1,000 people just maintaining the scientific bases. Many countries have bases on the continent and South Africa is one of them, and has a very proud history with Antarctica and was one of the original signatories to the Antarctic Treaty, which is a treaty drawn up just to say Antarctica is going to be preserved from any attempts by man to drill oil; it's only going to be used for scientific purposes. And to this day, that has remained. Obviously, we need to really protect that.

And a lot of the research that is actually done by the South African National Antarctic Program is space physics. Because of the location of Antarctica, the magnetosphere is at a position where we can study cosmic radiation, and obviously you get the chance to see an aurora – which I will show you pictures of later – which is the Southern Lights; many people know about the Northern Lights, but the Southern Lights are in Antarctica. And you see so many optical phenomena. You'll see haloes around sun, as in this picture; sun dogs or sun pillars, all due to refraction of the sun off ice crystals positioned at certain angles.

Okay, and the SA Agulhas; this is the ship that we went down on. She's quite old now and due for retirement, so there's a new ship currently being built and it will be very exciting when she's ready. The SA Agulhas is an oceanographic research vessel, so there are many labs onboard, where oceanographers – particularly from UCT; they've got a very strong department of research happening on all of these trips, both down to Marion Island, Gough

Island and to Antarctica. And yes, she's able to go down once a year to Antarctica, as well as do the trips in between to Marion and Gough Islands, and very sturdily built – not an actual ice-breaker, but she's got an ice-strengthened hull, so she can actually go through all this ice; so it's not like a Titanic scenario.

Okay, this is a little video, a time-lapse video, just to show us going through the ice on our way down; it's obviously speeded up a bit. ... And it really takes about two weeks to get down to the ice-shelf, and then you will often end up sitting at the ice-shelf once you've reached there, waiting for the weather to be good to fly, because the South African base is located inland.

These are pictures of me when we crossed the Antarctic Circle. And basically what happens is you get initiated, if this is your first time coming down, and you get dunked in below-freezing water; the freezing point of the seawater is -2 , so this is -3 water. And you get made to eat vile things, and it's all just terrible! But it's also a lot of fun as well, once it's over...

And that's the crossing the line ... And then other sights you see on your way down: Wandering Albatrosses – birds with the longest wingspan, following the ship. And then eventually you get to more denser ice; you start seeing icebergs ... Penguins – this is an Adélie Penguin; very beautiful birds, very curious; always coming to check out what's going on...

Okay, this is another time-lapse video just of ... You go into this absolutely surreal world. You just see sky and ice and it stretches out for ever. You have 24-hour daylight, so it's just this absolutely surreal experience. And I don't think you'll ever forget seeing your first iceberg and just experiencing this completely different "planet" that you enter into.

And then ... Okay, after the two to three weeks of travelling, you get to the ice-shelf and this represents a huge, almost 200 m-high wall in front of the ship. So it towers over the ship. And this is where you can go no further. So you eventually get to this and then 'okay, now what?' You have to get into the continent with all the food to supply the base for two years, and heavy vehicles; all the passengers need to be offloaded. So it's quite a lot of logistics involved, and for that reason there's a lot of diesel mechanics involved; the Department of Public Works comes down ... There's just a whole lot of people working together ... Pilots to fly the helicopters ... Everyone with their different skills works to try and get all of our cargo, all the scientific equipment, all the personnel onto the continent.

So once you're at the ice-shelf – you can see the Agulhas backed-up against the ice-shelf and one of the Dozer vehicles being offloaded onto a sled. And this Dozer will then actually be towed by a larger vehicle all the way – 170 km or even 300 km, depending on where you choose a site to offload – and it will be taken to the SANAE base. So this is offloading a vehicle via the ship's crane. Very heavy vehicles of 25 tonnes get offloaded onto the ice-

shelf and ... That's if we're lucky and get to a part of the ice-shelf where it's low enough; otherwise, like what happened this year, is that the cargo gets offloaded onto the bay ice, which has got to be at least 1,5 m thick before it's actually safe enough to offload the vehicles. So it can be quite treacherous and we've lost vehicles in the ice, actually. These whole vehicles ... A crack in the ice will open up and the whole vehicle will just disappear and the drivers will jump out. So the drivers are in life jackets, driving these things across the ice and at any moment the ice could crack and they have to jump out. So it's all very, very scary. But here, in this case, this was being offloaded onto the ice-shelf.

Okay, then people goes across with the man basket from the ship's crane. Okay, and then, what happens after all these containers are gone onto the ice-shelf, is that the Caterpillar Challenger vehicles, which we have, start towing them for up to 30 hours across the ice, travelling very slowly – 10 to 15 km per hour, depending on the load – and travel across the ice to the base to restock the base for the following year.

Okay and then how do the passengers mostly get from the ice-shelf to the research station? It's via helicopter. And just in the background there, that building that you see, that is the recently constructed emergency base, which is closer to the ice-shelf and where we offload; and it's used as an emergency base in case something happens to our own base, and also obviously used as a depot point for all the offloading onto the ice.

And then, after 170 km from the ice-shelf – or sometimes even more – then you'll get to Vesleskarvet. And that is a nunatak, which is a rocky outcrop in the middle of the ice, and this is the location for the SANAE research station. The reason that it's built on top of this flat-topped mountain is to prevent ice and snow build-up, because that's one of the problems with research stations in Antarctica, is that they have a very limited lifespan. So they just get snowed-in and obviously can't be used anymore. In the old days, the research stations used to be built underground, but they've now moved towards building them aboveground and fitting them with all sorts of fancy things: hydraulic stilts ... The Germans have just built ... they've just finished their new base and the British are in the process of completing their new base, and they can all be lifted every year on these hydraulic stilts, with snow shovelled under the stilts.

And so this is SANAE; this is where I spent basically 14 months. SANAE is 10 years old now. When it was built, it was one of the finest bases – it was actually the gold standard base in the whole of Antarctica. It's made out of three interconnected units, and they house various things, from labs ... We have a sauna there; there's a kitchen/dining hall; there's a generator room; and we've got a waste processing plant. And there's a helicopter pad that you can see at the end of the base. And we've got all amenities these days, so there is Internet, so you can stay in touch; there's even a telephone number, which is a local 021-number, and you can actually just pick up the phone and phone Antarctica and speak to the South African team, if you'd like to! And in the foreground you can see the vehicles, both the Dozers and

the vehicles that were used for towing our heavy loads, and those are situated there, just in the front.

Okay, another picture of base, showing the helipad there, at the side, and then the three interlinking units. And that vehicle there – I'll show you a better picture of it just now – is the Skidoo, or the snow mobile, which you can use just for riding around the base and getting to short distances and to the various scientific projects. A lot of the scientific projects are located outdoors.

Okay. And in the summer time lots of people descend on the base. It can accommodate up to 80 people, so it really swells from about 10 people during the winter, just a skeleton staff – there was a doctor, engineers, diesel mechanics, a meteorologist; just 10 of us – and in the winter it swells up to about 80. And we do various things: play soccer on the ice; play tug o' war; have takeover games, which basically mean the old team vs. the new team, and all different scientific teams play against each other.

And then this was the hospital inside the base. So this was where my office and work was located. So you can see there's just a big area of the hospital; bed to the side, which you can't really see so well, and then a dental chair, and through those doors, which you can see, is a full operating theatre. And then that's a picture of the operating theatre, which would also double as a resuscitation area; so theatre bed, everything – so everything that you need is there, because obviously there's no easy evacuation, especially during the winter.

And these are some of the vehicles we used to drive around – the Skidoo, or the snow mobile, and the Caterpillar Challenger, for going on longer journeys.

Okay, and there's a lot, as I said, logistics and work involved, and even though you're the doctor or whoever you happen to be, you still get involved in all the work. You get a crane operating course, a heavy vehicle driving course – we go on everything from cooking courses to fire fighting and mountain climbing courses; all or that stuff. And specific to my career as well, I had to go on an x-ray course and a dental course. So after a dental course of 5 days, you're expected to be a dentist (!). And dental problems actually happen more than you would like them to happen, but yes, you have to sort them out and ... Yes, by the end of the year I wasn't so scared when someone came to me and said they had a painful tooth, because you actually know what to do.

So, the other thing, which involves spades – and spades really become your best friends in a place like Antarctica, because you're constantly shovelling snow away from things or digging things out of snow ... And the other thing that you have to do, is fill snow into a snow smelter, which is basically how our water is provided. And that line that you see, that silver pipeline, it carries the water up to the base. So every day you go out, shovel snow and then that makes our water.

Okay, this is me on my birthday. So the tradition is that you get a snow bath and you have to go and lay outside and to shovel the snow!

And these are some of the animals you can see, obviously closer to the sea, but even inland. The Snow Petrel ... We have a Snow Petrel colony quite close to our base – about 20 km from our base – and also on the mountain, a lot of these Snow Petrels breed, so you can often in the summer see birds flying around. I mean, these most extreme conditions, but you know they survive, so it's just absolutely amazing. And obviously the seals and the Emperor Penguin colony, which we were privileged to see as well.

And then other things involving mountain climbing and crevassing and braaiing ... So it's the one place where, if you put your drink down, it's not gonna get warm; it's actually going to freeze up! So instead of the meat on the braai, you've got all your drinks sitting on the braai!

And then, as the winter comes ... And just to say that because we are quite far north – we are not as far as the South Pole; we're 71° south and the South Pole is at 90° south – we don't get like 6 months of pure darkness. You get about 6 weeks of the darkness, but you get twilight, so from about 10 till 3 you'll get twilight, so it's not completely, completely dark. And it's such a beautiful time. I mean, people will say that's the worst time and how did you survive the winter? And you know, most people are aghast that you can actually have survived that. But is such a beautiful time of the year, and only if you've over-wintered there can you fully appreciate it, because in the summer it's just harsh 24-hour daylight; whereas the winter, the colours become softer; you see the most beautiful, beautiful colours from the sun and the most beautiful sunsets and just ... It's just absolutely phenomenal. And yes, just the colour that the sky changes – just absolutely beautiful...

This is looking south from the base. So this would be heading towards the South Pole. And the mountains that you see are part of a mountain range, sunsets ... and then the green skies, the aurora. So that's the Southern Lights that you get to experience in the winter.

And this is little clip of the storms that happen. So you get just complete whiteout; you can't see anything. And sometimes you have to go out in these storms, to go and fill up the snow melter so we have water ... And yes, it can be quite hair-raising, but it's also lots of fun.

Another picture of clouds; you know, just these incredible formations that you see, that are just stunning. So that's a picture of some clouds on the horizon ... and the aurora australis; so the Southern Lights – I'll show you a time-lapse of that. And then you can just see the stars circling around and ... Yes, it's very, very impressive to be able to see that.

Okay, now the picture that I took of the aurora. That's another one with the Dozer in the foreground; this was taken on the 9th of August – it was Women's Day and this was about 6 o'clock in the morning on Women's Day last year (2009), so roughly around this time that this picture was taken.

And yes, just to demonstrate ... You know, you go to a place like this and you just are so humbled by the fact that you're there. You know, a human life seems almost insignificant just on the scale of this huge, huge wilderness. And I think it's got great lessons to teach us about ourselves and this planet and preserving this last great wilderness that we have. And I would just invite you to go to the SANAP website if you want to have any more information about it. They do have career opportunities on all three of the places, so Marion Island, Gough Island and SANAE. And speak to them; find out more. Anyone's welcome to contact me about my experience down there. It was just such an amazing experience, and I say just go and do something different and this is the perfect opportunity to embrace something like that, if you're wanting to get away from things for a while! Or for quite a while...! Yes, so thanks very much.

Q1: Thank you very much, Joanna. Do we have any questions? ... I don't really have a question. I just find out, were you the only medical person onboard?

JT: Yes. What happens is that there's one doctor for the year, and then in the summer there'll be two doctors, because there'll be a doctor coming down to take over from you. So during the summer season, which will be from December to February, there'll be two doctors for the summer. But then the rest of the year you are completely by yourself. And I was also the only female on the team. And yes, I would also encourage ... I see a lot of females here today ... But there's definitely not enough women that are in the scientific field ... Among the scientists there's not a lot of women, you know, amongst ... In the engineers, there's obviously not a lot of women, so just go for it and prove that you can do it!

Q2: Would you do it again? Do you want to go and do it again?

JT: I would definitely want to go again. I obviously need a bit of time back home, but yes, I would love to. But in a way, the only way to go down there is to spend a year, so it's quite a big commitment of your life. But I would love to go down again; definitely. It's also ... the knowledge that you can't just get down there is also terrible. It just burns up inside, and you really want to go down there, but to go there's not really much opportunity, unless, you pay a R100,000 to go down on a tour or something like that. I think that's one of the worst things, knowing that you can't get back there very easily. But I would love to go down there again, definitely. And I also, after coming back from Antarctica, I went down to Marion Island – I mentioned that it was a sub-Antarctic island – and I went down there for six weeks on the summer expedition, and that was also a really amazing experience – a lot different to Antarctica; a lot more wildlife; also crazy weather – raining, windy, snow; every kind of weather in one day – but really such an amazing experience as well.

Q3: Was your driver training and all that did that happen once you got to the base, or did that happen here?

JT: It actually happened here in Cape Town. We did all of that training at Barlow's for about a week; we did a day of crane operation and then we did a week of driving operation. But then obviously once you're down there, things are a bit different, so you know, you kind of have to get into how things work down there. It would actually be a better idea to do the training when you're there, rather than around a truck yard kind of thing, because it all changes when you're on the ice and you get stuck on the ice with heavy loads, trying to get heavy loads out of the ice and all of that. So it's all these kinds of things that you learn. And the people who come down for the summer expedition and do all of our driving, they are people from the military and the Department of Public Works, who actually have been there many, many years, and they're really, really good with the vehicles and all that kind of stuff, so you actually kind of learn from them in the summer and then winter, when we have to do it ourselves, then people know and learn; yes.

Q4: I want to ask you about that time-lapse of the aurora ... How long is that? Is that aurora just fleeting or does it last?

JT: It lasts. It can last for quite many hours; yes. So, as you've seen, it's quite speeded up and you're seeing a lot of hours in one frame. But you can see from the movements ... You can see that it's a dynamic moving thing, even if you just look at the sky. But then often you will just get sheet of colour for a while and then it will gradually fade. Sometimes it starts moving quite fast.

Q5: As a non-medical professional, I just want to ask you, do you ... The patients that you had to see, was it like typical routine things, or were there things that completely threw you, that you'd never done before?

JT: Well, as I said like the dentistry was very different; and it's weird, but as Murphy's Law would have it, it always ... the dentistry seems to be the most of your case load. For me, this year and the current doctor that's there ... we've had some quite major dental things to sort through, and we got very good support from a dentist located in Simon's Town – he works for the military there. So, you know, we'd always phone about it and say what does he suggest? And then, lots of people think oh, okay, it's going to be frostbite – treating those kinds of things, but with the protective equipment that you're given, you shouldn't really be exposed to frostbite – and taking the precautions, it should be preventable – so that's not really so much of what you see. So a large component of it is just like daily GP work, and then obviously major trauma is another component, because you're dealing with heavy vehicles; you're dealing with extreme conditions. So these kinds of things can happen. So you know, there have been cases where people have injured themselves quite badly, and in that case, you have to deal with that at such a remote circumstance; yes. So it can be anything really, anything that happens, but with that sheer isolation, the lack of ... I mean you have to take all your x-rays yourself and

develop them by hand. So, you know, it's not like being in a regular hospital, where everything's on hand; sometimes you have to improvise; yes.

Q6: So you're the only medical professional there and the trauma care and whatever ... Are there people who're trained to help you?

JT: Assist you...? Well, they've just ... Our team was just given a basic first aid course, so the rest of the training you actually do while you're there. So I trained my team up – more people that actually wanted to really assist; some people are a bit squeamish. But, as we were doing things, I would train ... Like I had a very good dental assistant, who was one of the electronic engineers who seemed to take a liking to medical stuff; so he was my dental nurse and if I had to do anything else, he would assist. He became quite good. So that would be up to you to just train your team and make sure that they knew what to do timely in the event of an emergency; otherwise what they did in Cape Town was just basic first aid before they leave. ... Was there another question?

Q7: What was your daily routine like?

JT: Daily routine?! Mostly in the winter it was sleeping in, and otherwise it was just basically whatever the team had to do at that period. We lost our water for about six weeks, because our pipe from our snow smelter froze up and burst; so throughout the winter, in –30, –40 degrees, we were outside mending this pipe. So all sorts of things go wrong, and you try and just engage in whatever ... You know, help the scientists out; I did weather observations after our team member passed away, and so I learned a lot about the weather. And doing that, I used to send off the hourly observations to the weather service. So, although I wasn't kept busy the whole time by medical things, I on occasion helped the other people. And also, the doctor is also in charge of the food stores. And I mean the food stores are just massive – you can imagine, that's two years of food; and it has to be provided. So that was constantly stocktaking and seeing how much we're eating and then ordering for the next year to make sure they have enough, and dealing with all of that.

Q8: Did you have any experience with team work? But it's actually quite interesting, your own experience of being a doctor and what happened to you yourself, and what you went through. That experience was quite an experience I never heard of from you.

Q8: That experience that you experienced yourself...

JT: Yes?

Q8: I never heard it from your life. So it's quite an interesting experience when you went through with you ... You know you're your own doctor; you had to be your own doctor.

JT: Yes, yes; exactly. There's no one else. Yes, that's also true; yes. And I think ... You know, I had to keep strong and my health strong, and everything, for the sake of the rest of the team; yes, definitely. It's a good point.

Q9: Did you have any life-threatening moments when you were out in the snow, where everybody panicked? Something could have gone wrong; someone...

JT: Well, every time you go step outside, it's always very dangerous. The weather can change very abruptly. And if you have to go out in a storm it can be very dangerous. But we always just tried and take necessary precautions. Like if you're out in a storm and there are very strong winds and reduced visibility, you need to rope up. So I think so every time you go outside is actually ... Anything can happen and you know you have to be cautious. Obviously something very sad happened on our trip. One of my team members were killed in a climbing accident. So I guess for me that would be the scariest moment of the trip.

Q10: Something a bit lighter ... You said you had to take care of the food stores. What kind of food did you take down?

JT: Okay, so ... Yes, as you saw, all the vehicles take the food across the ice, so we were really well-supplied. We had a massive dry store with everything you can imagine. So you don't live on canned food all the time. I mean we've got a huge freezer with lots of meat, frozen vegetables; and then in the summer, the ships brings down some fresh foods, so you start getting salads again for the summer. And then the rest of the year you can live quite well, yes, on sort of anything that can last for a while, besides ... Our potatoes, our carrots, onions all lasted till very far into the year; we were still having those things in July and August; still using onions and potatoes and things. So if you keep food properly and store it well, it actually ... It's surprising how long it actually lasts, yes. So, no, I think we never really wanted for much, and everyone put an effort into cooking and making really, really good meals and ... You know, we all ate really, really well. So it was great; yes. Not a problem.

Q11: So is your freezer just a room outside?

JT: Yes, that's one of the questions that people ask me all the time! Actually, there is a freezer outside, under the ground – that's the construction freezer, because it was used during the construction of the base. Obviously they hadn't built a freezer yet, so they stored the food underground. And we still use that as an emergency backup, and then the rest of the food is in a freezer inside the base, which is properly temperature-controlled. And so that's where all our meat is, but if we run out of meat from there, then we go to the outside freezer and get from there.

Q12: So you actually have refrigeration units...?

JT: Yes.

Q12: But why don't you just pipe in air from outside?

JT: Pipe in air from outside?

Q12: Yes. For the freezer?

JT: Well, the thing is the temperature actually fluctuates such a lot; I mean it's not always going to be a constant -20 degrees. So ... In the summer, we got up to +4 the one day, so you know! But I'm sure that there are more economical ways of doing things, and actually with regards to things like that ... I mean, we have three diesel generators, but they have also constructed ... Stellenbosch University has constructed a wind turbine, so we actually be moving onto the renewable energy sources. And you know a lot of the bases are ... the newer bases have renewable energy things in place. So there's a big move towards that obviously, the way things are going. So I guess there are better ways of doing it than having just a powered refrigeration unit.

Q1: Just a last question ... If students are interested in similar opportunities, can they just go on the website?

JT: Yes, yes; to the SANAP website, yes. And they will see a list of all the careers available and get in touch with that. I mean the program's also affiliated to universities and projects, so often they'll send out people. But in terms of ... I don't know ... Yes, there are people from Upper Campus here as well out there. So it's not all medics. I mean obviously there's a lot more scope for people from other areas of life to actually go down there and do things; medicine's a very small part of the whole thing.

Q10: Yes, as I understand, they especially want engineers to stay for the year.

JT: Engineers? Yes, definitely.

Q1: Any last questions?

Q13: I'd just like to know ... The selection process, is that very long and involved and... ?

JT: No, not so much. I think it's a very big commitment to take a year off like that, so there are very few people who will actually be able to do something like this; with family commitments or work commitments, people are scared by the idea of going away for 14 months. But it's becoming more and more popular, and there's a big drive now out of getting people interested. And there's a lot more publicity about the SANAP program, because a lot of people don't know that this exists. A lot of people are really unaware of this program. I mean, firstly they may not even be aware of Antarctica even existing, but then even more so, they are unaware that South Africa has such a big hold on Antarctic research. It's gradually being publicised a lot more, and there's actually two girls here that are doing a thesis and the Antarctic Legacy Project, so they're gathering information from the whole history of

the SANAP program and putting it all together and doing some great work; and then in turn, that will actually get it out there, what's going on. So yes, thanks for coming!

Q1: Okay. Thank you very much Joanna, and for all of you for coming.