CSIRO Oral History Collection

Edited transcript of interview with Annabelle Duncan

Date of interview: 6th February 2019

Location: CSIRO, Black Mountain
Interviewers: Professors Tom Spurling and Terry Healy

Professor Annabelle Duncan PSM, *MSc (Otago), PhD (La Trobe) FTSE*

Summary of interview

Professor Annabelle Duncan was born in Nelson, New Zealand on 31 May 1953, the younger daughter of two children. Her parents met in England after her father, a New Zealander, had been demobilised from being a prisoner for most of the war.

In the first part of the interview Annabelle talks about growing up in a small town in New Zealand, the daughter of a small businessman in the building industry. She recalls how some of her father's prison experiences affected her upbringing. 'One of the comments that he made to me on a number of occasions that has coloured much of what I have done - and excuse my language but I will use it exactly as he did. He said, "Never judge anybody by where they come from, what race they are, what nationality they are. Some of the biggest bastards I ever met were on the inside of the wire with me, and some of the nicest people I met were on the other side pushing food through the wire, or fireboard or whatever, to help us as we walked up."'

Annabelle did well at secondary school and won a scholarship to study pharmacy at Otago University. She talks in depth about her experiences as a country lass going to a big city and how this has influenced her later career as a Vice-Chancellor of a regional university. She talks about the influence of mentor (now) Emeritus Professor Margaret Loutit. It was during this time that she was married and supported her husband while he was doing his PhD.

The couple moved to Melbourne in 1981 and Annabelle enrolled in her PhD at La Trobe University. It was during this time that she commenced working with the water treatment group at the CSIRO Division of Chemicals and Polymers and this led to her appointment as a Research Scientist in the Division. She talks briefly about her experiences juggling work and family.

In 1990 Annabelle was asked to advise the Australian Government on biological weapons control. This opportunity changed the course of her career and she discusses this period in some detail.

Annabelle became a Program Manager in the Division of Chemicals and Polymers in 1995 and then the Chief of the Division Molecular Science in 1999. There is a discussion of the changes that took place in the Organisation under Dr Geoff Garrett and some of her immediate post-CSIRO experiences.

In the last part of the interview, Annabelle talks about her time as the Deputy Vice-Chancellor and then Vice-Chancellor at the University of New England and gives her views on future directions for the national innovation system.

NOTE TO READER

Readers of this interview transcript should bear in mind that some editing of the transcript, including additional material in the form of footnotes and endnotes, may have occurred at the request of the person interviewed.

Swinburne University of Technology and CSIRO are not responsible for the factual accuracy of the memoir, nor for the views therein.

Please note that the printed word can never convey all the meaning of speech, and may lead to misinterpretation. It is strongly recommended that readers listen to the sound recording whilst reading the transcript, at least in part, or for critical sections.

This is an interview with Professor Annabelle Duncan for the CSIRO history project, oral history collection. It is the sixth of February 2019, and we are in an office in the CSIRO headquarters in Black Mountain. I am Tom Spurling, and with me is Terry Healy. Thank you very much, Annabelle, for agreeing to this interview. Could you please confirm your understanding that Swinburne University of Technology will own copyright in the interview material, and that access to the material will only be given in accordance with the instructions you give us in the rights agreement.

I can confirm that, yes.

Thank you very much, again, for agreeing to take part in the history project. In this interview, we are going to be talking about your early life and experiences, your career before and after CSIRO, and towards the end, about your views on the evolving role of CSIRO in Australia. Let's start at the beginning. You were born on 31st of May 1953. What about your early life? Your parents. Siblings. Primary school experiences.

I was born in Nelson in the north of the south island of New Zealand. The younger daughter of two children. My sister is six years older than myself. Both of my parents left school at 14. Neither of them had much education. My father met my mother after the second world war when he was demobilised, having been a prisoner of war. Demobilised to the UK, and he met mum in England. Married her six-weeks later, so there is a certain amount of -

Was she English?

She is English, so she was English, and she followed him out to New Zealand. She did not work after she got married. My father returned from the war and set up a small business with two of my uncles, originally doing curbing and channelling. Later on, doing building, and then he established a factory making concrete cavity bricks. That is all I remember.

He was a tradesman?

He was a tradesman, essentially.

What had he done in the war?

He had been a prisoner for nearly all of it. He was captured in North Africa very early in the campaign. He was on a German ship going from North Africa across to Bari, and the ship was sunk. Unfortunately, he was picked up by a German ship, not by an allied ship, so he remained a prisoner and he was marched from Bari up to Germany over however long it was.

I guess, some of those experiences, for dad, did have an affect on how he brought us up. One of the comments that he made to me on a number of occasions that has coloured much of what I have done - and excuse my language but I will use it exactly as he did. He said, "Never judge anybody by where they come from, what race they are, what nationality they are. Some of the biggest bastards I ever met were on the inside of the wire with me, and some of the nicest people I met were on the other side pushing food through the wire, or fireboard or whatever, to help us as we walked up." Because it was a pretty bad experience that he had. And so, that sort of coloured the way that he looked at the world, of how you

judge people by what they are and what they do and not by where they come from, or anything. That was very much part of what we did.

Prior to the war, he had – As I say, he left school at 14. He started an apprenticeship with – I can't remember whether it was Cadbury's those days, or whether it was Mackintosh's, but the sweet factory in Dunedin in New Zealand. After the war when he was demobilised, he was given a job temporarily with Mackintosh Caley in England, another sweet manufacturer, and the foreman of the group that he worked with was my mother's brother-in-law, which was how he met mum in the first place.

Was your mother working at that factory?

No. My mother, at that stage, had been working in shops. She had always worked in shops. She had never had an education, and that is what you did if you had no education. During the war, actually, sorry, she worked on the buses. She was a 'clippie' on the buses. That was the type of work that she had. No education. Very bright woman who, as I remember it from my teenage years on, was extremely bored and probably should have been working, but dad prided himself on having a good enough position and enough money coming in that she didn't have to work, because you wouldn't work if you didn't have to.

In Nelson at that time, married women probably didn't work a lot.

No, and the women who did – A couple of my aunts worked, but they picked fruit, and one of them was a dressmaker. Picking fruit is not exactly an exciting job to do and it doesn't pay well, and it is hard work. There weren't great jobs for women to do anyway.

Somebody inspired you to work hard and climb the heights. Was it your mother?

I think both of them were very – Education was important to both of us. My sister is six years older. She left school at 16, much to my – especially my father's distress, I think. She said she wanted to leave school and he told her she could leave school if she got a good job. She had done typing and shorthand at school, which girls did, and she got quite a good job working in one of the offices in the local hospital. It was seen as a good job in those days, so dad had to say, "Yes, it is okay. You can leave school," but he wasn't happy about it.

I initially did typing and shorthand when I went to high school, but I discovered a real liking for science, so I started to do science. Very much like a lot of people who are first in family, you look around at what do you do if you have got a science background. Where do you work? And you look in your local community. So, what was there? There were teachers. There were doctors. I knew I didn't think I was bright enough to get into medical school, but I couldn't imagine being a doctor anyway. You could be a nurse. You could be a pharmacist. They were the sort of jobs. So, I decided I wanted to be a pharmacist. That is where the good luck started, Tom. There has been a lot of good luck.

We had a relief teacher at my high school at one stage. He happened to have been the principal of my primary school. He was also in Rotary with my father, so he knew dad very well.

What was his name?

Mister Harding. The Duncan family was quite a large family, so he started, and he was going around the classroom and he said, “Which one are you?” and I said, “I am Gordon’s daughter,” and he said, “Okay. What are you going to do?” and I said, “I am doing pharmacy. I want to do pharmacy when I finish here.” He said, “You are not going to go to Polytech in Wellington, are you?” I said, “Yes, I am.” He said, “You go home, and you tell your father that you are going to Otago, and you are going to do a pharmacy degree.” So, I went home and told dad that I was going to do a pharmacy degree because Mister Harding – We called him sparrow head, but that is all right. Mister Harding told me that that is what I should do.

Dad was worried because he thought it would cost a lot of money that we didn’t have. And then, we looked into it and realised that if I was able to get a university bursary plus the top up you got in New Zealand for moving away from home, which I had to do to go to university, most of the costs would be covered, providing I could get a job over the summer break. After that, he really encouraged me to go to university.

But, to let you know what it was like and the different attitudes, one of the brothers that he was in business with, one of my uncles, asked dad why he was going to let me go to university because I would get married and have babies and it would be a waste. As you know, I did, and I did, but I still went to university.

Annabelle, can we just go back a couple of years. You went to the primary school where Mister Harding was the principal.

Yes.

Did you start becoming interested in science in primary school?

No. It was really when I went to high school that I got really interested in that.

That was a government high school?

It was a government high school.

In Nelson?

In Richmond, it was, which was eight miles, or ten kilometres, out of Nelson. A co-educational high school.

A big school?

It seemed big at the time. It is now about three or four times the size that it was when I was there, but it was big for the time, yes. Very, very good science teacher there, Mister Hogg. He encouraged me in science. I think that is where I got the real interest in the science.

It is interesting because, as I said, my sister left school early and she had exactly the same teacher.

Was she as that same school?

She was at the same school, but she had left by the time I got there, because of the age difference.

You say that you did shorthand and typing. Did all girls – or you chose to do it?

No. In fact, I chose to do it. In fact, that was quite interesting, because at the end of – We had primary school then intermediate, which here is middle junior high, isn't it? Year seven and eight, and then on to what is here year nine. So, I went to Richmond school, which was where Mister Harding was the headmaster. Then, they built a new school to cope with the post-war baby boomers. Henley Primary. I went to that. On to Waimea Intermediate, and on to Waimea College. All co-ed schools. When we went to the high school, we had to choose our courses. It was generally accepted that if – There was streaming. I was in three-one and four-one, and I went on to high school. All of my colleagues did French, and some of them did Latin. At that stage, I was going to leave school at 16/17 the same as my sister and work in an office, because that is my background and that is what I thought of. So, I did shorthand and typing. Sorry, it was form one, form two. Instead of going into three-one with all my friends from primary school, I went into three-five because that was the first -

The commercial class.

That was the commercial class, and there were four of us from my group in middle school that – two of the boys did woodworking, and two of the girls did typing, so we were all in three-five. At the end of the second week of high school, they had to re-stream and muck up the timetable and they moved us into three-one, because it was obvious that we didn't belong in three-five, but we wanted to take those – So, it was an aspiration thing. Why would I learn French? I would never need French. I would probably go overseas at 20 for a year to England to visit my family. I would come back and marry and have my babies, as my uncle said.

So, it as a matter of; what was your aspirations? What was your life experience that governs what you do? Where you have got to be very careful not to shut doors. But if you don't know about that, then that is the way it is.

Mister Harding persuaded you to go to Otago University? Was it Otago University then, or was it still part of the University of New Zealand?

No. It was Otago at that stage.

It had become an independent entity?

Yes.

What year was that, Annabelle?

I can't do it from there, so it would have been –

Do you remember what age you were?

I would have been 18, so whatever that is.

It would be 1971.

That would be right, yes.

Was going from Nelson to Otago going into the big city?

It was. It was a real shock.

So, it was quite a culture shock for you?

It was a huge shock. It was a lot bigger. Nelson, or more particularly Richmond – I mean, you went into town, into Nelson, maybe once a month. You didn't go very often. You mainly stayed in Richmond, which was tiny. Because my dad was in business, everybody knew – and he made concrete cavity blocks, and it was the post-war building boom. Our Sunday afternoon drives used to be to go around the harbour on the reclamation looking at where all the buildings were with his new building blocks, which was really boring if you were a kid. But that is what it was. But it meant that everyone knew dad, and then I went to Dunedin and nobody knew me. It was not liberating. It should have been. Later on, it was, but initially, it was quite scary that there was no one there that I knew.

Where did you live when you moved there?

I lived at college. I lived in a university college. In fact, it was called UniCol.

Was that a co-ed college?

It was a co-ed college.

For the whole time of the degree?

No. I lived there for two years. Then, I moved into a flat for one year, with four girls. Then, I moved into a mixed flat, and then by 22 I was married. So, I did fulfil my uncle's -

You say that you went there to do a pharmacy degree.

Yes.

Did you do that?

No.

Tell us the story about your undergraduate education.

It is not a good story. The reason he suggested Otago is that it had Pharmacy, but the first year of Pharmacy was what was called Medical Intermediate. You did chemistry, biology, physics and a maths subject.

And that was a common choice?

That was common for just about anyone, and because Otago had the medical school and that was the medical intermediate that everybody did, it actually had a very good reputation.

You say, chemistry, physics, biology?

Yes.

So, biology was zoology and botany?

And botany, yes. For the first year, it was. I got partway through that year and decided that, from what I could then understand about what pharmacy would be, it would be dead boring, so I was going to do biochemistry. My second year, I did biochemistry, chemistry and microbiology, and I did microbiology as a – I had to have a third unit. I didn't know what it was all about so I just did it because I thought that would do. I was not very good at biochemistry or at chemistry. Don't dare tell her that, but I wasn't very good at either of them, but I actually loved microbiology. I actually failed every subject in my second year.

Too much fun.

Mum died believing it was too much fun. Now that I have to have responsibility for students, I know it was actually depression. I was really, really homesick. The first year was a novelty and I could get through it. The second year, the novelty is gone, and I was really homesick and didn't – When I look back at everything that I did that year, they are all classic signs of depression. But it didn't exist in those days, so you didn't have it.

Did the Otago University have student counselling services?

They might have, but they weren't readily available.

They weren't -

I wasn't aware of them.

So, the people in charge of the college didn't have any sort of pastoral care over the students.

There was no pastoral care. It was very much like some of the colleges are still, and some of the big universities here, I think. It is a student hotel. There is your room. We might provide you with food, but we don't provide you with anything else. UNE is a bit different. We can come to that later, but it is important.

At the end of second-year, what happened?

I think I got – Did I get a D? Which were technically passes but they didn't let you – You could count them towards a degree, but you couldn't go on to this higher level, so I had to repeat. But of course, I then also lost my bursary, so then there was a real problem. This is where the good luck came in, again. Failing was actually good luck for me. The first part of the year, my classes were all in the morning. I didn't have to repeat any of the practical, so only the lectures and exams. I was free from midday every day, so at midday I went down to Gregg's. Gregg's was a factory that made spices, or packaged spices. I did a full eight-hour shift

packing spices for the next several months. Starting about midday. Finishing about eight-thirty at night. The first half with the women that worked there fulltime. And then, they went home at five and I stayed on for another half shift, which was when all the students came in that were fulltime.

And then, about halfway through that year, I got a phone call from a professor of microbiology who called me in and said, "Why did you fail last year?" I said, "Probably, I didn't work hard enough," and she said, "Well, you shouldn't have failed," which was the first time there was any encouragement for me, at all, from the university. It was very impersonal, for a start. She said, "I need a technician. Do you want a job?" So, I started working for her. That actually put – I would never have done a PhD if I hadn't worked for her.

What was that lady's name?

Margaret Loutit, and Margaret has been a real mentor to me. She is still alive. She is in Auckland. She is getting a bit frail now, but I still keep in touch with her. Every year she writes me a Christmas letter that I can't read, but she writes it to me every year. But she was really important.

Annabelle, did Otago University have a medical school?

Yes.

So, was the Department of Microbiology part of the medical faculty?

It taught into the medical - Yes, it was. It was part of the medical faculty. When I started working in it, it was co-located in the medical school. It went into a purpose-built building on the main campus. I don't know if you have ever been down there, Tom, but the main university is built around the Leith and around old bluestone buildings. It is magnificent. The medical school was about a kilometre-and-a-half away, but we moved back onto the main campus with a purpose-built microbiology building after I had been there for a short while.

I worked there part time, and studied, and that is when I started to get a little bit more confidence. When I was working with the lecturers, but also seeing the people that were doing honours and the like.

And, you were out of the college at this point, into a flat.

I was in a flat.

With some of your friends.

With my friends.

Was your mental state much better by then?

Yes. It got much better at that stage. I think it got better once I started working with Margaret. It was the encouragement of saying, "You shouldn't have failed, and you should be able to do something." And actually then thinking maybe it was the place I should be.

At the end of your second attempt at second year, you passed all subjects?

I passed them all.

Did you get your bursary back?

No, I didn't, but I continued to work part-time for Margaret right up until I did -

So, you stopped working at the spice factory and went to work for -

Went to work for the university, yes. And so, that is when I decided I would do – not Honours, because I couldn't do Honours because of that failure, but I could do a postgraduate diploma which was the equivalent. It was the same classes as everything else. And then, after that, I went on and did a Master's degree. Margaret Loutit, the mentor that I had there, would not allow her students to enrol in a Master's and switch over to a PhD. If you enrolled in a Master's you had to finish the Master's. By the time I was doing my Master's, I was married, and Bob had finished his Master's degree and was working, so he supported me while I was doing it.

So, his Master's degree was in microbiology as well as you.

Microbiology as well. That is where I met him.

You met Bob during your undergraduate degree in microbiology?

Yes.

In your third year, what did you do? Was that microbiology and biochemistry?

Actually, because by that time I had enough units, so by the third year – the fourth year as it was, but the third year when I had – I did microbiology. I had enough other – I just needed one more unit to finish, but it didn't have to be a science unit because I had the credit for the other ones, even though they weren't very good. I actually did phenomenology of religion, which was a huge amount of fun and I really enjoyed doing that. So, I went on from there.

You say you couldn't do Honours because you had failed a year. Was that a quirk of the regulations at Otago University?

Yes.

You did the postgraduate diploma of science. That was like an Honours year?

That was like an Honours year.

At the end of that, did you get a grade?

Yes. I got a pass with credit, which was, I think,

Like a second pass.

It was two-one.

And so, then you went straight from that to your Master's degree with Margaret.

With Margaret, yes.

What was that about?

I was looking at the survival of antibiotic resistant bacteria through sewage oxidation ponds. There was some evidence, and it did look to be correct from what I did, that bacteria that carried antibiotic resistance actually survived the treatment process better than those that weren't antibiotic resistant. So, when you were taking the treated effluent out the other end, it was actually enriched for antibiotic resistance, which wasn't a great thing, but it was part of the spread of all of that. That is what I was doing with that. We used to get sewage samples delivered every Tuesday night. They used to come down from – The operator of the plant, the engineer, used to go up on Tuesday to check that it was all right. Drop them off about six o'clock at night, so I would go to work at six o'clock at night and process sewage samples

That wound up with a thesis?

That wound up with a thesis, yes.

And you published paper from that?

Not from that one, no. My academic record is not great, Terry.

During all that time, you say you got married when you were 22.

Yes.

That would have been in that year that you were doing the postgraduate diploma.

Yes.

And Bob was finishing off his Master's degree.

Yes.

What was the plan of the newlyweds? What were your ambitions at that point?

At that stage, I don't think we ever gave much thought to what all the next steps would be, because you knew in those days that you were going to get a job, and a reasonable one, if you were at university. While I was doing my Masters, Bob was working in the local catchment board, in water catchment.

After his Master's degree, he got a job in water treatment, sewage treatment?

In Dunedin – Well, water catchment. It was clean water as well as sewage. More clean water, actually. But, part way through that, he realised that to do very much more, he actually needed a PhD, so once I finished my Masters and he supported me through that, he then

had this brilliant idea about doing a PhD with a wife to support him. So then, he came back and enrolled for a PhD.

At Otago?

At Otago.

In microbiology?

In microbiology. At that stage, his thesis was looking at chromium transformations from – microbial transformations of chromium between the various states. Particularly, coming out of tannery effluents. I then got a job working in the university in the Department of Nutrition, with someone who was looking at selenium metabolism. Selenium is actually – Which way around is it? Selenium is normally low, isn't it, in most places? Or is it normally high?

It is normally low.

It is normally low? It is high in New Zealand, and so we were looking at what happens with selenium metabolism and the dangers of it, but also where you needed selenium and where you – Because selenium is actually good for dealing with vitamin E metabolism. So, looking at all of that.

It seems from looking at your record, that during all this period that you were doing Master's, and that Bob was finishing his Master's and so on, you had two children.

No, the two children came much later. Much later.

So, there were no children at that point?

There were no children. No.

Sorry, I misread that.

The children came long after my parents had given up all hope of having any grandchildren from this side of the family.

Can I just go back to your parents at this point? During the troubled year that you had, what were your parents thinking? Did they think they had made a mistake sending you down there?

I don't think they realised what was going on. When I look at what happens with my kids, and with the kids at university now, everything has changed so much. We had three terms in the university. All of the assessment was at the end of the year. There was nothing through the year. It is not like you pass this trimester and then you go on to the next one. It was all at the end. I could only go home – In fact, I didn't – Yes, I did. I went home in the university holidays, for two weeks each time, but they didn't really know. Once I got home, they didn't know that I was not doing very well or was not very happy. I don't think they had too much idea. We communicated by writing letters, because toll calls were expensive. You just didn't do that, so I don't think they had any idea. And as I say, when I failed, I am pretty sure my

mother thought that I was out living it up every night, which was not what was happening. We see it a lot, anyway. People hiding their symptoms.

They were prepared to let you go back and repeat it?

Yes.

So, they kept supporting your ambitions to get a degree?

They kept supporting, yes.

Were they surprised that you swapped from pharmacy to a science degree?

Not really, because they didn't fully understand university and the subtleties of any of that, at all, anyway. So for them, it was; get a degree, get a good job, because that is what I said I wanted to do. It was all science and they didn't really see a big difference of it. It is something that has been interesting since I have gone to Armidale, where we have a lot of students that are first in family. I compare their problems, when I talk to them, and their challenges with the challenges of my own kids who went to Monash and had two parents who knew exactly what university was about.

When you say, 'first in family', you are meaning the first in the family to go to university.

Yes.

Sorry, can you finish that point. You are talking about Monash. You moved on to Monash?

That is later, but my kids went to Monash. When they went to Monash, because we both had PhDs, we knew what they were studying. We knew what was involved. We would have picked up changes in courses much more quickly, whereas my parents had no idea. It was just this strange institution. They were supportive, but they didn't fully understand what was happening.

While Bob was doing his PhD, what were you doing?

I was working in the nutrition department as a scientific officer, tech-type person, there. Not a job I enjoyed, and in fact, Bob's PhD supervisor was also Margaret Loutit. Towards the end of the time, when he was writing out, every – was it Friday or Thursday? There was a local market. Monash is, of course, and the back of – Sorry, no. There was a local market at – I am in the wrong place now. At Otago, there was a market somewhere. She would buy me a bunch of flowers and give them to me at the end of each week and say, "Just stick the job for another little while, because Bob is writing up now." So, she always was encouraging. Always helped both of us.

Was this an early example of a feminist intervention?

Yes. She was very good. Margaret came from Burra in South Australia, with her husband. She had two sons. John got a job at Otago. She followed. Had the two children, then she did her PhD quite late. And then, she got a little surprise and there was a third son that I used to babysit for when I worked for her. But she quite often, if we went on field trips or anything

together, would talk to me about bringing up the kids. Balancing it with working, studying. So, she was very encouraging, and perhaps helped me to think about what was possible.

She made a comment to me, Tom, very similar to one that a conversation that you and I have had. She is the lady that I met many years later, and she said, "It is quite interesting how two of my least academic students have ended up doing very well in their careers," because neither of us were really great academically, but we knew what we wanted to do and we knew how to play to strengths, I guess. She encouraged us.

We are now up to the end of 1981, I think, and Bob has got his PhD, and you have finished your Master's degree. What happens then?

Bob then started looking for a postdoc and was tossing up what would he do. There was a job that was offered to him in Taupo. I think it was with Fisheries, which would have been quite a lot of fun, but I said; if we go to Taupo then I will probably end up -

Where is Taupo?

Right in the centre of the north island of New Zealand on the lake. A very pretty place, but a bit isolated and not a great deal there. I said, "I do want to do a PhD as well, and so I will probably have to spend more time in Auckland." And then, he got offered a postdoc, actually, at La Trobe in Melbourne, so that is the one he took.

A postdoc in microbiology?

Yes.

La Trobe doesn't have a medical school, so that was a department of microbiology in the faculty of science?

Yes. So, he took that, and I enrolled there and did a PhD.

You came to Melbourne and immediately enrolled for a PhD?

Yes.

In a sense, your academic career has, at this point, gone fairly smoothly.

Yes.

You had worked. You and Bob have swapped around.

We swapped. Tag-team.

Both of you have successfully done research degrees. You, a Master's. Bob, a Master's and a PhD. You come to La Trobe. He has got a postdoc, and you enrol in a PhD in microbiology.

In microbiology.

At this point, from my reading of The Web of Science, there are no publications by A. Duncan.

No, and there weren't any from the PhD, as well. The next big lesson I had is; don't enrol to do a PhD with a supervisor if you don't know the supervisor. It can be an unpleasant experience.

Okay, so your PhD experience with La Trobe wasn't a happy one. When did the children start appearing?

At the end of the PhD, I then went to Monash, and then at the end of that first year at Monash, that was when Lachlan was born. So, a year out of my PhD was when Lachlan was born, and Nicola arrived three years after that.

That was with Ron Bayly?

Ron Bayly, yes. He was my next mentor, and he was wonderful.

He was in microbiology at Monash?

He was in microbiology. With him, I was working on a project that was a combined project with CSIRO. So, CSIRO comes on at that stage, as well.

Going back to the La Trobe experience, what was your PhD about?

I was looking at the interactions between microorganisms and algae and coral, so I was doing a lot of -

Interesting project.

Yes, it was interesting. The coral was more interesting, but of course, that meant going to Queensland once a year for field trips, which was fabulous. Of course, I always went in June. But, with the algae – Algae won't differentiate if there aren't any bacteria there. There is obviously interactions with compounds that the bacteria form that the algae need, so trying to grow algae with no bacteria on them at all, you just get little blobs of cells. You don't get – With the coral, it was more interesting, because when corals get stressed, they try to ward off the stress. They produce a huge amount of mucus-type compounds, and they then usually die. But what seems to be killing them is, again, the interactions of the bacteria that grow in that mucilaginous layer, rather than the stress itself. So, you get a lot of sulphide producing bacteria growing in the base. They were the sorts of things that I was looking at. It would have been much easier to do it ten years later with the new tools of microbiology, so it was, again, very difficult.

And, Bob was a postdoc in microbiology?

In microbiology.

With the same supervisor?

Yes.

How long was he a postdoc there for?

I think that was three years.

And then, he got a job?

Then, he went to Melbourne University and he worked with someone call Bruce Grant in the Botany department, looking at Phytophthora die-back and use of a phosphorous compound. And again, it was the change of the state of the phosphorous that affected whether or not it could kill the Phytophthora or whether it didn't. So, he did a postdoc there. Then, at the end of that time, he got offered a job at CUB. About that time, it was the same time that – I have jumped a little bit and I will come back to it - I got offered the job at CSIRO. So, our three years in Melbourne for his postdoc and my PhD.

So, your PhD, you did it fairly quickly.

I did it fairly quickly. I did it in, I think, three-and-a-half years altogether.

You went from La Trobe to Monash, and you didn't work at Monash for very long before you got offered the job?

I think I had been at Monash about 18 months, and a job came up in CSIRO. Tom, in those days, if you learned there was a position, various staff in CSIRO would compete to get the position. I went to an interview at CSIRO already working on a combined CSIRO project, so I sort of already knew CSIRO at little bit at that stage. I think I had an interview panel of about 12 people. It was quite terrifying. That was chemicals and polymers.

So, by the time you went to CSIRO, the water treatment group had already come into chemicals and polymers.

Yes.

Brian Bolto was the head of that.

Yes, and Bill Raper was the immediate boss.

Dave Solomon was the chief.

Yes, that is right.

Was he in the interview panel?

Probably.

I can't remember who was there. I know it was just a huge number of people and it was really rather terrifying, but I got the job. I remained based at Monash for about the next six months after that, as well, just because that was where all the equipment, and then I moved over the road, up to the Clayton centre.

That was in 1988?

Yes.

Because the Division of Chemicals and Polymers started on the first of January 1988.

Right. That must have been it, yes. Right at the very beginning.

So, you were at the very beginning of that.

Yes.

And then, they had the division – the chemists started moving into the building during that time.

That is right, yes.

What was the job, Annabelle?

This was looking at phosphate removal from sewage. Most of my background was sewage up until that time. Looking at biological removal of phosphate. In Australia, as in South Africa and Israel, a lot of the summer flow of waterways, small waterways, is actually effluent from sewage treatment plants, and if you don't get the phosphate out then you get algal blooms. You only have to look a Menindee at the moment to see what that does.

You can get rid of phosphate out of water of any type, or sewage effluent, using chemical coagulation, but you end up with a very loose flock that is hard to get the water out of. Hard to get rid of. Whereas, there are certain bacteria that will accumulate large amounts of phosphate, but if you don't get the conditions right, they will let it all go again. So, you have got make sure the conditions are always kept right so they accumulate it, and you get those bacteria out, and you get the phosphate out with them without them releasing it again. We were looking at those conditions.

This is just curiosity, but the phosphate, does that come from human activity?

Mostly, yes.

So, what detergents you put in your washing machine.

Detergents is probably the highest – from human waste as well, but most of it comes from -

In country areas, some of it comes from superphosphates?

Yes.

Run off from superphosphates. The postdoctoral position at Monash was Australian Water Research Advisory Council research fellowship.

That is right.

I don't know that that body exists now.

I don't think it does.

So, was that made up of the water authorities? What was the Australian Water Research Advisory Council? Was that a -

I think it was, but I can't be certain, Tom. Ron Bayly and Bill Raper had got the money through that and employed me on this, and I think Nancy Millis was on the interview panel as well, if I remember correctly. She knew my supervisor at – I wonder if I should do this. Yes, I will. He is probably gone. Her comment was, "Well, if she can manage a PhD working with that supervisor, she probably can actually do the job, so give her the job." That was quite good. I was very happy with that.

From what you have told us, you had had a lot of experience at actually working as well as studying, so you had had a career up to this point where some of the time you had been employed by someone and some of the time you had been a student.

Yes.

You come from the university system into CSIRO in 1988. What was your impression of the organisation at that point?

I think there were a couple of things. I remember the very first thought that went through my mind when I found out that I got the job is; this is a permanent job, and I can stay here until I retire. It didn't work that way, but -

You were offered a -

A permanent position, yes. It was almost scary, because as you can see, you go from short-term money to short-term money, and you think – I guess at the time, it almost seemed too grown up and too responsible, and I was now in a career. But it was a good place to work. The facilities were good. The support was good. We continued to collaborate across with Monash, and I enjoyed that as well. There were times when it was still very male dominated at that time.

That group in particular.

Very much so. Actually, that is true because -

You would have been the first female scientist in that group, I think.

I was, yes.

They would have had female technicians.

Yes, but you had Noni and company over in the chemists, but not in that group. Of course, by this time, I had Lachlan who was in crèche, and there were times where the group itself would have meetings. We would start them at four o'clock, and they might spend the first half-hour or so discussing the football result, etcetera, and I had to get to crèche and pick up Lachlan.

Was the crèche at the -

No, it wasn't. There wasn't a crèche on site.

There wasn't a crèche there, then?

No, so he was in the Monash crèche, and he remained in the Monash crèche when I moved over.

So, your daughter hadn't been born at that point?

No.

You are predicting my next question, answering my next question, really. How did you find raising a child and being a fulltime scientist?

There are things that you do because you don't have an option, so you don't analyse it very much. Whenever I have got anyone working with me now, I always say, "How long are you taking off when the baby is born?" I had 12 weeks with each of my kids, and I say, "Don't do that."

Is that too short?

Too short. Far too short. I don't think the kids suffered, but I think I missed out on a lot. But it was hard work.

So, Bob was working fulltime?

He was working fulltime.

At CUB at that point.

At CUB.

In Collingwood somewhere? Abbottsford?

No. In those days, he was based at – The labs were just opposite the Vic Market, so he was in the city. That was another of the issues, of course. He had the long commute. Lachlan was in creche at Monash, so I was picking him up all the time. It was really hard for Bob to get there. So, if meetings went beyond five-thirty at night, it got very hard for me.

Did many meetings go beyond five-thirty at night?

Yes, because they weren't in a hurry to go home, because that was just their life. So, perhaps the crèche hours seemed a little shorter to them than they really were, so I could always get there on time to pick Lachlan up. I would just have to leave those meetings early. They were the sorts of things where people didn't understand the juggle, because they have never had to do it. That made it a little bit more difficult.

In terms of CSIRO being supportive, was it early days in terms of CSIRO being supportive of women in that situation?

I think it was. I will say I never felt a lack of support, more a lack of understanding, perhaps, of what was involved. I guess, it was just something that you accepted that you did. Later on when I started travelling, and we will get on to that shortly, that is when I started to employ someone from the crèche. So, when she finished crèche at night, she would bring – By that time, I think it was just Nicola, home. No, it would have been both of them. Bring them home and wait at home with them until Bob got home. There was a period of time when I worked for very little money, because most of it went on to various types of childcare. Childcare is still expensive, but it is a lot more flexible now, and the crèche on site, of course, makes a huge different to people now.

This is nothing to do with your story, but my recollection of the working times of fisherman's being down there, and even when the chemists went down to Clayton, is that most people went home at six minutes past five, but the water group -

Usually they did, but every so often with the water group – One day a week, they would have this meeting, and it would go on, and they weren't in a hurry to get home because they didn't have to be in a hurry to get home. So, it might go until five-thirty, quarter to six, and by quarter to six, I would be gone. I don't know how much it went past that, but it did do that. Mostly, it finished just after five and that was great, because that was easy then for me to pick up the kids and get home.

Were you part of the group of people who agitated to have the crèche, the child minding?

No.

So, you weren't -

I wasn't part of that. I don't know why I wasn't part of it. I think it was just by that time my kids were in school, so I guess it wasn't. It wasn't that it wasn't important to me personally.

I think we started doing that in about 1989, or something.

Yes.

John Stocker was the chief executive, so it was probably in the 1990s, early 1990s.

Yes, probably.

Looking back on your career, your career in CSIRO and even before, it was a great success, but particularly the work that you did in CSIRO was very successful. What was the atmosphere of the organisation that helped you succeed, or how did you overcome parts of the atmosphere to help you succeed?

I think other than that lack of understanding of needing to juggle, everyone was supportive. Everyone was. Ron Bayly's lab was a reasonably large lab, so there were quite a lot of people involved, but it was that larger group. Working in that larger group at CSIRO. Having the connections across to the university, to the water authorities. And, working that big group was quite exhilarating because you were getting access to people from different points of view, and having come – not so much at Monash when I was already working across with

CSIRO, but certainly prior to that working in a microbiology department in a single discipline area, and then suddenly going and working in CSIRO where there were the chemists. There were not very many biologists in those days. But just gradually getting different perspectives. That was fun.

You would have been the first biologist to join the group.

I was the first biologist, and then Keith joined us, and that was two of us and that was it.

Did you noticed while you had a foot in both camps, Monash and CSIRO, any difference in philosophy approach between the two different organisations?

I think the biggest difference was money. CSIRO did have more money than the universities had.

For equipment and support?

Yes. Especially for equipment. For the ability to buy or have manufactured any sort of specialist bits of gear that you might have needed to do the work we did. More ready access to facilities, if you like. Shortly after joining CSIRO, we got the contract with BHP, and working with big organisations like that, where if you want some sort of kit, they will build a pilot plant, because – Whereas, when you are working with a university, it doesn't tend to happen to the same extent.

CSIRO had that laboratory on the Yarra River.

Yes, at Lower Plenty.

Were you using that when you were with Monash? Were there Monash/CSIRO projects at that plant?

Not at that plant, because that was a different facility and it didn't have the biological phosphate removal. What we were working with mainly, was the plant that was up at Bendigo. There is the sewage treatment plant up there.

There was also some sort of field facility at the creek that ran through Monash, at one stage.

Didn't work on that, no.

You weren't part of that?

No.

Tony Priestly used to -

Yes, Tony used to work on that one.

Can I ask in relation to the difference between Monash and CSIRO, was there a difference – For example, and I am just making this up, Monash might have been more academic in terms of its goals in terms of publications.

Yes. A lot more so.

Whereas, CSIRO was more goal oriented towards solving problems for the environment or for industry?

Yes, and that was very much part of it. I think that is, again, why I felt comfortable in CSIRO. It is partly coming from the background that I have. Trying to explain to my parents, for example, esoteric academic research, would be much harder than saying I am trying to make sure that the effluent from a sewage treatment plant isn't going to cause us problems with the creeks. It is just something I have always tended to gravitate towards a lot more, so I do enjoy that side of science, and it was very much part of what I was doing with all the projects.

Was there a good system for focusing the work in order to achieve the objectives?

I think because all of the projects, pretty well, that we were on were industry funded, there was this push to make sure that there were outcomes from the work.

Were you personally involved in talking to industry people?

Yes.

What kind of communication was that? Was it professional in terms of they understood what you were doing?

Yes. Pretty well so.

They were technical people?

Mostly, they were technical people, yes.

J.W. May, who -

May? John May?

Was he at Monash?

He was at Monash. Ron Bayly was my postdoc supervisor, but Ron and John collaborated together, so John was sort of my secondary supervisor. Not officially so, but very much a part of it.

The other name I didn't recognise was Vasiliadis.

George Vasiliadis. I think he would have been classified as a technical officer.

At Monash?

At Monash.

He wasn't at CSIRO?

He wasn't CSIRO, no, but he was one of these people who had been at Monash in a technical role for probably ten or fifteen years. Universities tend to have fewer of them now, but they are absolutely the backbone of the lab because they run them on a day to day basis.

Industry people often complain that CSIRO costs more than doing work with a university. Did you come across that?

Absolutely. Yes.

So, you think that was true?

No. I think that was a lot of business peoples' attitude to that. Later on, and it was after I had become chief, we had a project with a company, and the chief executive of that company came on one day complaining about one of the staff members. Didn't like working with them, and I said the staff member was an extremely good organic chemist. I would vouch for what he had. "Well, he is too expensive, and we are not going to use him anymore." The chief executive brought his chief legal officer with him, who happened to be a QC and his brother-in-law, but that is another issue. When he said, "You charge too much and I can get this work done more cheaply elsewhere," I said, "No, we charge what is a fair rate." Because we had actually done– You had done quite a lot of work, Tom, and then we continued it; what is the full cost of research? His argument was that he paid his taxes and therefore he shouldn't have to pay the full price of the research, and I pointed out he didn't pay taxes - Sorry, that it wasn't to give him a leg up over somebody else that he paid taxes, and he had to pay the full cost. There was competitive neutrality. He couldn't have any advantage. He had to pay the full cost.

Was he also saying, "I can get the same work done cheaper at a university?"

Yes, and so I pointed out to him that Monash was across the road, and I thought that he should walk over there and get it don't there. Whereupon, his lawyer kicked him under the table, but he is not a man to take very much notice, so at that stage, we showed him out and pointed him in the direction of Monash. He didn't come back. He came back to haunt me when I got to UNE, but that is another issue. But yes, it was a very common view. But it was an erroneous view because it is not why you pay your taxes, to get free research done by CSIRO.

But, was Monash cheaper?

No. It is not, and he knew it wasn't, and his legal officer knew it wasn't. The issue with research at university as compared to CSIRO - and this is why you need a CSIRO and you need a really strong CSIRO. Universities, most of the research is done by people who have at maximum about 40% of their time available to research. Most of the hands-on research is done by a PhD student or a postdoc. Both of whom, especially now – not with my CV, but mostly now – need to get papers to get that next step. So, they have to be quite focused on; what is this project? How can I get a thesis or papers out of it? Solve as much of the problem as possible, but I might not get very far, and it won't be nearly as professional. If you are a PhD student, until the end of your PhD, you are not exactly a high-level researcher.

Whereas, in the CSIRO, if you take on a project, you have got professional scientists working on it right from the start, and if you are actually paying them fulltime, they are working on it fulltime. They are not going off to teach. So, it is going to cost more in the long-term to get the outcome you want, from a university. Always, that is going to be the case. It is false economy to go after it any other way.

It came clear to me a few years ago when we had the problem with lyssavirus. Mary O'Kane, at that stage, was the chief scientist of New South Wales and she was looking for bat experts to do some work, and she said, "The trouble is, when I speak -" and she was talking to the New South Wales vice chancellors. She said, "The trouble is, when I talk to you, you always all tell me, "Yes, you have got a bat expert, but they won't be available for six weeks because they are teaching at the moment." I need someone who can start work tomorrow on this project."

That is the difference between having an organisation like CSIRO. If you want real, rapid response and someone who can dedicate themselves to solving a national problem, you need a CSIRO, and you need a CSIRO with sufficient flexibility in terms of the funding to actually be able to drop everything and say, "This is an important program. We have actually got to do something about it." I don't think we have got it anymore, but we can come to that later if you want to.

Annabelle, you can see that I am looking at your publication record.

Yes.

Between when you joined CSIRO in 1988 and the various promotions that you got, you hadn't actually published a lot. Why do you think that the organisation decided that you were worthy of being kept on? I came into the division in 1989, and I think it was at the end of your probationary period you would have had, and I can remember being persuaded that despite the lack of papers that you had, that we should keep you on.

I don't know how they persuaded you of that, Tom. I am very grateful that they did. I don't know how that happened. I think after that, a lot of the opportunities came my way, came because of you, and they came because you put me on the biological weapon stuff.

Yes, but we will come back to that later. I am just interested in this period before the biological weapons stuff. Let me give you my theory on this. I think that you were the only person in that group who was a biologist, and I think that they said, "Well, Annabelle is providing an expertise and capability that we don't have without her, and therefore we need to keep her on."

That is as good a theory as any, because I honestly don't know why they kept me on, Tom. I have never had very many publications. I am not great with that sort of thing.

Were you not interested in writing papers?

Not really.

Not really?

Look, we were bringing in money, and we were bringing in money because it was the combination of the biology and the chemistry, and the projects that we got. I came in on that phosphate project in 1988.

You stayed, really, in phosphate. The papers that you published in that time were all about microbiology of phosphate.

They were all about phosphate. That is right. I stayed on that, and then Nicola was born in 1990, and just before I went on maternity leave with that, the pulp mill – There was the proposal to build the new pulp mill in Tasmania.

At Wesley Vale?

Yes, and there was money coming available for that, to look at – No, sorry. There is one before that. When did this one fit in? There was a project on the Gippsland system. The treatment of the waste through – that was the same one. When Wesley Vale came up, there was money made available to research what happened to pulp and paper waste, and the treatment. The theory was that if you had alternating aerobic and anaerobic treatment, then the organochlorines got bound up in the sediment and didn't get released at the other end. So, it was actually, I think, while I was on maternity leave with Nicola that I wrote a grant application for that funding. That was using the Gippsland system as a demonstrator for what could happen with the right treatment system, if you put a system into Wesley Vale. The argument there was; if you didn't put it into Wesley Vale with a well-researched good treatment system, the paper would be made in the Philippines and the waste would all go straight out to sea and you would be far worse. And so, I got that grant. So, I think part of that was getting the money coming in for those.

Wesley Vale didn't actually go ahead.

No, it didn't go head, no.

Were you part of the taskforce that CSIRO set up to look at the Wesley Vale?

Yes. We went around Tasmania talking to different communities.

When you say, "We," who was 'we'?

There was a group of people of which I was one, and I can't remember who they were now.

I think we will have a break now, thank you. When we come back, we will start on the next phase of your career.

[Break]

Thank you very much for doing this, again, Annabelle. We have just come back from lunch, and we are going to start now talking a bit about your experience in biological weapons control. Annabelle's career and my career intersect a bit, so I know a bit about this, but I will start asking you, Annabelle; you were asked by the Department of Foreign Affairs to be an expert advisor on biological weapons control, I think, in 1990.

Yes.

How did that come about, and why did you accept that position?

It was the beginning of 1990, or early in 1990, that I was asked by you if I would do this. I remember that the discussion we had was -

Discussion with me?

With you, and I think this was information you had been given from DFAT, that it would be an interesting job that was really scientific methods. Looking at common sense and what was involved in this, and by the way, there was the opportunity for a lot of travel. That I would probably be going to Europe a few times a year to do this work. I asked you if I could have 24 hours to think about it and let you know the next day. I went home and said to Bob that I had been offered this. That it was the possibility of travel, "But it is all right, I think I am just being told that because it is a carrot to get me to say yes," and, "Don't worry, because he and I knew at that stage, but nobody else did, that I was actually pregnant with Nicola at that time." I said, "I won't leave you holding the baby, because I am sure that the travel won't happen." The baby, I think, was 18 months old before I travelled the first time, so technically I think she wasn't a baby then, so I didn't really go back on that.

But the reason that I did it was because I thought it sounded as though it would be something really interesting to do. I guess, the idea of arms control, given my dad's experiences during the war, was fairly important to me. And it seemed like a really good opportunity to do something a bit different. Like others I know, I also get bored fairly easily and this looked like something that would be a lot of fun. So, that is why I did it.

Looking back on it, what I did for you was interrupt your scientific career a bit, because my recollection is that this took quite a bit of your time.

It took a lot of time. While writing is not my favourite pastime, I did do a lot of writing in this, but it wasn't publishable. It was stuff that went into this work, that was not generally available. So, a lot of my effort over that time then came to this, because as we talk through it, you see that I chaired various subgroups and things and that required quite a lot of work. So yes, it did, and again, I think it is something I now say to people, "If you are being offered an opportunity, are you shutting a door and are you happy to shut that door?" Am I happy that I shut that door? Absolutely, because so many other doors opened as a result of it, and I don't regret it in the least.

From your perspective, what were your qualifications? What raised you up in people's eyes as to doing this job? Both from a scientific point of view and also from an, if you like, general management point of view?

I think first of all, interms of who should do the job, I think I was in the right place at the right time. I think, by that time, there were two biologists in the division, and because Gareth Evans – It was coming through DFAT. Gareth, I think, was sort of, more or less guiding what happened. Because Tom had worked for Gareth, he came to Tom for advice. It had to be a biologist. I had another biologist working for me, but I guess I was the more senior of the two of us at that stage.

That was Keith.

That was Keith. And so, I got the job. In terms of; would there be people who were better qualified? Australia didn't have any biological weapons research work going on at that stage. Never had any offensive biological weapons research, but we didn't have any defensive work at that stage. We weren't allowed to. We have got a little bit going on now.

But we did have – The Department of Defence did have expertise in chemical weapons, with Bob Matthews and the group at what is now DSG, but they didn't have similar expertise in biological weapons. For some reason which I have never understood.

No, but they had never done it, so there was no one who knew anything about biological weapons. But when it came to looking at what they actually wanted - I actually started this work around October/November 1990. That is when the first actual work started, because I was on maternity leave, and they started sending me papers and asking me to comment on them. Most of that was – I guess you would call it scientific method. We might also call it common sense. Do the papers make sense? Are they self-contradictory, and if they are contradictory, which way do you go? Where does the balance of evidence come? So, it was really providing advice on things like that on the basis of weighing up scientific evidence from the papers provided.

So, not high science?

It wasn't high science. It was just using scientific method so say; are there other explanations for something that might have happened, as an example, or; how would you interpret these series of events?

Can you give us any examples that are public knowledge, of the kinds of biological entities that were subject of weapons consideration?

I can tell you something that happened, and it happened outside these negotiations. It actually happened in the Pugwash Group. Pugwash got involved with the biological work as well. There was an agreement that after smallpox was eradicated, the two known stockpiles of smallpox – one was in The States in Fort Dietrich, one was held in, I think, Novosibirsk in Russia. The agreement was that at a certain time each of them would destroy that stock so there would be nothing left. That date came and went, and there was a long discussion that went on in diplomatic circles, but it came into Pugwash, so I can talk about what happened in Pugwash. Pugwash started having their meetings in the margins of the arms control meetings in Geneva, so a lot of the people that were controlling those negotiations were also going to the Pugwash meetings.

There was a proposal put forward that you couldn't destroy the stockpile because there was concern about whether there really were only two repositories, or whether some had leaked from those depositories and gone elsewhere. There was worry about where some of the soviet material had ended up. And worry about what would happen if there were smallpox victims in the permafrost and they were released. How would you get a vaccine? There was a huge discussion around this, and about how you wouldn't be able to vaccinate if you destroyed all of the stocks.

So, that was a valid argument?

No, it was not a valid argument, but it was an argument being made by -

Why wasn't it a valid argument?

I will tell you in a minute, why it wasn't. Some of the people making that argument should have known better. I let that discussion go on for quite a long time and then I broke into it to tell them why it wasn't a valid argument. You don't use smallpox to vaccinate for smallpox. You actually use a different virus.

Cowpox.

You use vaccinia rather than variola. I think that is the way around it goes, and so it was a totally erroneous argument, but it sounded good if you weren't a microbiologist and you didn't actually know the difference.

I don't know anything about this, Annabelle. If you are making vaccines for Hepatitis B, what do you use? Hepatitis B, or do you use some other?

For many things, you use the organism itself, but for smallpox you don't.

Why is that?

It is because there is actually cross-reactivity, and it is much safer to use cowpox than to use smallpox. If you were to catch cowpox, it is not going to do a huge amount of harm to you, but it will still give you immunity against smallpox. Whereas, if something went wrong with a smallpox vaccine and it wasn't deactivated properly, for example, you would be in real trouble. So, it is just safer.

So, the smallpox vaccination that we all used to have, was cowpox?

Was actually cowpox.

I think that in the back of my mind, I know that. I knew that.

Yes, and I think a lot of people knew it, and some of the people who were arguing that definitely knew it, but it didn't suit.

What happened to the stockpiles? Are they still there?

They are still there. They have still kept them.

Does it matter?

It matters in so far as – It doesn't matter if they remain under lock and key and you can trust people not to let them out. Personally, I don't know -

In an all-out war -

It would be a real problem.

Temptation.

Yes. That is right. One of the things with biological weapons is there is always this feeling that they can come back and bite you so you have got to be very careful about what you use, so how do you actually protect your own people? And that has been a problem with biological weapons over the years, where they have come back to bite. But, if you have groups, and we do have groups now, who use suicide tactics, in those cases, if you had someone like that, it doesn't matter that you don't have any protection from it, and that is where it gets scary. I think it should have been destroyed.

Just coming back to my question. You have answered it, I think, on the scientific side. You also said that you had to chair quite a few meetings. What was your general managerial experience that would help you manage people in that kind of environment?

My first experience of doing this was at Australia Group. It was the very first Australia Group meeting I went to, and it must have been about 1992, I think. The Australia Group is a technology control regime. For certain controlled equipment you need to have an export – an end-user certificate to be allowed to import whatever the equipment is. Australia Group started up looking at the chemical weapons side of things, and this was the very first meeting that they had to start looking at biological weapons.

Which countries were in this Australia Group? There was quite a number, weren't there?

There were a lot. Most of what then you would have called western Europeans.

The US?

The US, UK, Japan. I think Korea was there. Us. New Zealand. That sort of western group, if you like. The way the meetings worked is that the first part of the meeting would be so-called expert group meetings, and they would then make recommendations that would go to the political people at the end of each group of meetings. I was asked to go to be the so-called expert biological advisor to the Australian delegation. The person from DFAT who was chairing that meeting started the meeting and said, "We are here to look at potential biological equipment and agents that should be controlled. I don't know anything about it, so I am going to get Annabelle to chair it." I had never been to a multilateral meeting. I had never been to an arms control meeting of any sort. I had never chaired anything in that environment at all.

So, no training at all?

No training.

Had to learn on the job.

You learnt on the job.

This was Richard, was it?

No. This was someone called Henry Fox.

I know Henry Fox.

You know Henry? Okay, so he was – I think at that stage, he was about a third secretary. I mean, the expert – It wasn't high up, and then Richard would have chaired the plenary at the end of the week.

Did the DFAT official stay in the room?

He stayed in the room, but he didn't have very much to do with it.

The other people in the room from the other countries, were they biological weapons experts?

It, sort of, depended on the country, but the representatives from the UK, for example, came from Porton Down, so they were microbiologists with expertise.

Did you know them?

Not previously, but I got to know them. The ones from The States were often from somewhere like Fort Dietrich. A lot of them had expertise. Some countries didn't, but most of them did have some biological weapons expertise.

Your position as chairman has to be accepted by the group?

Yes.

How did you achieve that?

In a sense, it was the Australia Group -

It is one thing to get put there. It is another thing to get and keep control and respect.

I think it was actually starting to look – Henry did help me a little bit with this, but it was actually – I think I treated it mainly as an honest broker role rather than trying to tell people what to do. Making sure people got the chance to speak. Not trying to impose my will on it, partly because they knew more than I did, but letting them talk about it. But also, starting to look at how we could get through problems. Understanding where people were coming from. By that, I mean we had very loose instructions, I think. It was; try and get something here that will work, and that was more or less the instructions we had from DFAT. Make sure it makes sense. Make sure we get where we want to go.

But other countries in the US - I think we can name in this one - they would have very, very specific negotiating instructions from Washington. So, if you got to a position where – and I will use an example. If you want to put a particular piece of equipment on a list to be controlled, and one country is saying. "No way. It can't go on," and another is saying. "This is absolutely vital, and we won't budge. It has to go on." Neither of those groups can actually budge in a public meeting, so how do you actually work around that?

One of the things that I used several times during those meetings was to actually use Henry and say to Henry, "Morning tea is not for another three-quarters of an hour. Go and see if

you can get it here in five minutes," and break for morning tea, and then talk to each group and say, "How far can you go?" "How far can you go?" Because neither of them would do it in the meeting, but if I could then come in and say, "What about if we had a compromise like this? Would this work?" So, trying to get those sorts of things happening.

That is very sophisticated. You might have learnt some of those techniques working with your siblings and your children.

My children were very small at that stage. I don't know where. It just seemed that it was the – I think it is. It is taking two people apart and saying to each of them, "Where are you coming from?" I think that must have been where it came from. It just seemed like it was the only way we were going to – I won't say that I came up with it immediately. I think we went around in circles for a very long time before I decided it was the only way we could do it.

It is a very important skill, and so you developed it on the job, and you got respect in that role. And so, you were the subject of repeat requests to perform that role.

Yes.

And you had respect from the participants.

I think I did. I think when I then started to go to the meetings in Geneva, the UN-based meetings, that came over, where I was asked to be facilitator or chair of some of those groups as well, for that reason. Australia also was very much an honest broker itself at that stage, because we weren't closely aligned with any particular other country. I think that really did help. I think it is certainly why the chemical weapons compromise script got through, Tom, because we were well regarded. I think it is why it flowed over into the biological. Australia had that reputation. It was a matter of maintaining that reputation.

Can I just clarify the timing of some of these things? The chemical weapons convention discussions had been going on for a long time, and the rolling text was a very old document that had been rolling on for a long time. Australia, through the foreign minister, Gareth Evans, got the rolling text, all the amendments - the up to date rolling text, and eventually that chemical weapons convention got through Geneva and was signed. Was there a similar biological weapons convention rolling text? My memory is that the biological weapons convention came after the chemical weapons convention.

No.

That is not right?

It was the other way around. There has been a biological weapons convention since – I used to know these numbers.

A long time, okay.

In the aftermath of the Second World War, it was developed quite quickly, but it was a "thou shalt not" convention. There were no verification provisions in it, so there was no way of checking if anybody was cheating on it. So, what we were doing wasn't negotiating a

convention. It was getting a verification protocol. I mentioned Australia Group. Let's go on to the verification protocol, if you like.

Were biological weapons used in the First World War? Chemical weapons were used in the first world war., but were there any biological weapons used?

There were attempts to use biological, and I am pretty sure, if I remember, it was in the First World War, but they were very crude. I think they used infected reindeer that they released up in the Arctic Circle, because people were moving things around.

What about in the Second World War?

In the Second World War, the Japanese had a very big biological weapons program. They did test them, and they did use them in China. They had facilities in China, in Japan, in Malaysia, and I think somewhere else in Asia as well.

But they weren't used in Europe?

They weren't used in Europe, no.

And nothing got loose?

They did. In fact, Japanese soldiers were killed from the biological weapons that the Japanese used.

But, once it is in the field, you can't get rid of it.

It depends what it is. Some of these things don't last forever. Some of them, you get very limited person to person spread. There is a rabbit plague that doesn't have person to person spread. You can get it through inhaling it. Anthrax is one of the classic biological weapons agents. I could probably isolate anthrax from the soil outside here. I know I can isolate it from the farms around Armidale, because it occurs quite frequently in rural populations, and it is mainly sores on your hands. I think that is called a shearer's disease of some sort. If you get cuts on your hand, you are likely to get anthrax from wool or from soil.

Anthrax as a cutaneous disease is easy to fix. If you ingest anthrax infected meat, you will feel pretty horrible but you will survive. But if you get pulmonary anthrax, if you inhale it, then you won't last very long at all. It looks like flu for a start, but then it goes into a full haemorrhagic disease and you will bleed out. So, if you want to weaponise anthrax, you have got find a way to keep it up in the air so people breathe it in, but then unless I sneeze over you, you are not actually going to get person to person spread of it, so it is self-limiting in that respect. So, you can put it out there.

Where the Japanese got caught, I think they were using Cholera and they were infecting wells, but it was such a secret program they didn't tell the troops that were following behind the biological weapons people, and they got the Cholera from that.

And Cholera occurs in the environment anyway.

Yes.

That is not new.

No. Cholera is not new.

Anthrax is not new either.

No.

So, they weren't genetically engineered devices?

They weren't putting a new thing into the environment?

No. There was nothing new that was going into the environment.

The task of the Australia Group, and your task, was not to come up with a biological weapons convention from scratch, but to develop verification techniques and control techniques for the transmission of the –import and export of equipment.

Australia Group was import and export of equipment and organisms that could be used. The verification negotiations – Australia Group met in Paris, in the Australian embassy in Paris, because Australia set it up. But the Europeans weren't keen to come to Australia, so we went to Europe. The verification work was under the auspices of the UN, so it was all the members of the UN. About the first two years, I think, of those negotiations were looking at the technical feasibility of verifying compliance with the convention. So, were there things that you could do to say, "This country is cheating. This one is not cheating. What they are doing is fine." And there are a lot of things that you can do to verify compliance.

I will give you some examples. One of them is satellite observance, for example. One of the facilities that we would have ended up declaring under the regime if it had gone ahead, would have been [company name redacted] a vaccine facility, and that is a classic type of facility that you could use to make biological weapons. So, is everything going in there going where it is supposed to be? Looking at their exports. Looking at satellite surveillance of whether what is happening there is what they say is happening there. Inspections. All of those types of things can be done.

And so, at the end of that two-year period, we had said; yes you can verify compliance. You can tell that a country is cheating. The next stage was; how do we put this into a legally binding instrument that actually will allow us to do it? Forget the satellite compliance. No country is going to allow another country to observe what is going on. International inspectors – when we spoke to biotech companies in Australia, they all said, "We are inspected so many times, we don't want another inspection, but it doesn't really matter to us, so yes, come in." But I will say that not every country that was a member was prepared to allow that, for probably many reasons. So, inspections became quite fraught. Would you have inspections? Would you not? What circumstances would you use? So, then starting to look at what was actually possible. And so, there was a lot of negotiation around what could go into the convention and would could not go into the convention. A lot of texts and sub-texts going on, but also a lot of –

I think I am happy to say this on the record. There is a huge amount of hypocrisy in arms control. And so, some countries standing up and saying, "Why would I allow you to check what I am doing here, when you as the nation that is proposing this has got the biggest nuclear arsenal in the word, and you are telling me I am not allowed nuclear weapons at all." And we had those discussions. A lot of undercurrents, and a lot of other things that needed to be taken into account.

We were starting to make some progress. I think we were getting close to a text that may have been negotiated, and then I became Chief of Division and dropped out. And then, shortly after that, there was a change of government in America and the Americans pulled out of the negotiations, and the whole thing fell in a heap.

What is the situation in 2019 with biological weapons control?

The UN resolution that stated we would try to negotiate a verification protocol, still stands but it stands in abeyance with an agreement that nobody will try to do anything about it, otherwise the Americans will pull out of that agreement. It is just in abeyance.

So, there is a biological weapons convention.

But there is no verification protocol.

Whereas, the chemical weapons, there is a verification regime?

You have got a verification protocol, yes.

And there is control of controlled substances.

Yes. There is still control of substances through Australia Group, but of course, that is only the members of the Australia Group. That is not everyone else.

For biological?

For biological, yes.

Can I just get back to your – We were talking about the period from 1990, the end of 1990 to 1996, or something. What happened with your science in CSIRO at that point? You were still the senior biologist in the Division of Chemicals and Polymers, working within that water treatment group

Yes.

What happened to your scientific projects in CSIRO during that period?

I must say, all of the science that came out of the group at that – the hands-on science that came out of the group at that stage was really Keith. We did have a project with BHP, and we were looking at treatment of industrial waste through baffled anaerobic reactors, at that stage. And so, I was involved with that, but not the hands-on science with that. But I did meet quite a lot with BHP over that.

BHP had that laboratory in Mulgrave.

Mulgrave, just down the road, yes. It is quite interesting, because there is a lot of literature, or at least there was at that stage, around collaborations and how even if you are on the different floors of the same building, you don't get good collaboration. BHP was two kilometres away. It wasn't that far, but it was still a car ride to BHP. It was a brilliant collaboration. It worked really well, and it worked well because of the relationships between all of the people who were there, and all of the people in our group.

Your role was primarily as a research manager? Not a researcher.

Yes.

And, your experience in weapons control, and so forth, would have presumably helped you in managing people, with either a light touch or a heavier touch if you needed to.

Yes.

How did you find that experience of managing people and not being directly a worker?

I think that is where I perhaps realised going into science wasn't the right thing in the first place, because I really enjoyed the greater interactions with people. I like that. I like working with people, and I like trying to find solutions to people problems. A lot of it, right from the beginning, that I mentioned before about just being asked to chair that group, is actually not showing too much doubt. If you have got to do something, pretend you know and see if you can convince other people. The first inspection I did in Iraq -

You probably learnt that from me.

I might have learnt that from you, but it is a really powerful lesson. There was no training in what to do as a biological weapons inspector, when we started going into Iraq. There was no real guidance about what you did. You got a safety briefing beforehand. I could tell you a bit about that later, if you want to know, but it was just; we are going to inspect something today, and what are we inspecting? The first place we went was a university laboratory. The very first inspection.

So, we have now gone off the Australia Group and onto your experience with UNSCOM.

Yes. Do you want to go back to Australia Group?

No. I think it is a good time to switch to the UNSCOM. United Nations -

Special Commission on Iraq.

How did you end up going to those inspections in Iraq?

When they started looking for inspectors, because there are not a lot of people – "They," being the UN. There are not a lot of people who are in the biological weapons field, so they actually came to those of us that had been involved with the UN negotiations around

verification, and looking specifically at the biologists that were involved with that. A lot of those inspectors, I had already met in Geneva, and then met them again in Iraq.

But this UNSCOM was both biological and chemical weapons?

It was, and nuclear.

How many people were on that? The first time you went was in 1993. How many people were on the team?

On the team altogether, the full team must have been about, maybe, 20-something people.

Who was the leader of it? Was that an Australian or an international, another person?

No. International. He was an American who led that one. His name was Geoff-something, and I can't remember his surname. They split us into two sub-teams, and the deputy inspector was a Canadian, and he was the leader of the team that I was on. Not the leader of the whole lot. The leader of the team that I was on. He was a Canadian called Ken Johnson. He was a microbiologist, but he worked for the Canadian defence people.

You were talking about walking into one of these facilities with no training.

You just said; okay, this is the background. These are the people who run this lab, now go and inspect it.

You have got about ten people?

Yes, and you wander around. What do you do? One of the people on the trip, when we got back on the bus, he sat next to me and he said, "I thought this was your first inspection." I said, "Yes, it is." He said, "It is mine too, and I didn't know what to do. How did you know what to do?" I said, "Well, I didn't have a clue, but I was meant to inspect the place, so I thought the logical thing to do was to open some cupboards and see if there was anything in the cupboards." So, that is what I did, and then I just made a list of anything that I saw there. If you don't know what to do, fudge it, and that is what we did. And it is what they wanted. They wanted to know what was in there.

On your sub-group, were there both biological people and chemical people?

No. They were specific teams.

And you were looking for biological?

We were looking for biological weapons, yes.

You didn't have special sensors and sniffers?

No. Some of the teams took samples. We didn't. Really, sampling is of limited value under what we were doing. But there was a group of people there, some of them did have chemical engineering expertise, for example, so they knew what to look for, for scaling up of

production of things. So, you had people with different expertise, but all around that biological production side.

Was it a hostile environment? Did you have grumpy people standing around saying, "What are you doing?"

It depended on who they were, where we were. We had minders assigned to us all the time.

Iraqi minders?

From Iraq. No, they weren't. We had always with us, translators. The translators were all military. Western military. The first time, we had -The UK provided the translators the first two trips I went on, and Germany provided the air transportation. And then, the rest of us would have had some sort of science technology background. But we also had Iraqi minders assigned to us. The Iraqi minders were actually chosen as people who knew nothing about whatever they had been doing, so that they could actually say, "We had nothing to do - Why are you persecuting us?" And I had that question. "Why are you doing this? We don't have any biological weapons." They honestly believed that. That is what their government had told them.

But of course, it was known by UNSCOM, who ran a lot of these labs, and so when we were talking to those people, that could get a little bit fraught on occasion because they were covering things up. They had to.

As a mother of young children, this is not a recommended course of action. To be in a foreign country like that, confronting people who are very angry about you being there.

I think my husband would have agreed with you on that one.

Did you ever feel at risk in any way?

I think there was once when I felt at risk, and there were two occasions where I should have, but I think the adrenaline was so high that it wasn't until afterwards that I did. When I felt at risk was when we first went in the very first time. The teams all assemble in Bahrain, and you have a briefing in Bahrain about what to expect. "Don't go anywhere on your own."

The briefing would have been from the United Nations people, or from US military?

It was actually UK.

UK military?

Yes.

And, "Don't go anywhere on your own." Was that addressed to women, or everybody?

Everybody. Nobody could go anywhere on their own. "Don't go in large groups, because you will attract attention to yourselves," so smallish groups.

When you went on your own to the university, or when you went with your team, did you have a security person with you?

Yes. There was always a military person with us, somewhere. It was usually the translator, but they were military, and they were trained.

They were on your side?

They were on our side, yes. There was always someone like that with us. Depending upon what the nature of the inspection was, we might have more than that. But that briefing that we had was a little bit frightening. Then, when we got to Iraq, we had another briefing. Of course, I sort of joke about this one, that while you are having that briefing, the military transport planes that take you, take off back to Bahrain, so by the time you finish that briefing, you can't get out anyway. You are stuck.

But that is where they started to say, "Don't talk in your hotel room about where you are going the next day on inspection, because your rooms are probably bugged. Some of the rooms will have cameras in them. Don't lock your suitcase, because if you lock the suitcase, your rooms will be searched as soon as you leave it the next morning on an inspection. They will search your suitcase, and they have been known to cut the tops out of suitcases to search them. So, you might as well just leave it open and at least have an intact suitcase." That was all quite frightening.

And then, by the time I had been there for 24-hours, you sort of realise, it is actually not that frightening. We always do have people with us. It is probably okay. It is probably not going to be happening. I will admit that the first few times when I came back to the hotel room, I would gather up all ofmy clothes – It was mid-summer, the first trip. It was really hot - Gather up all of my clothes, take them into the bathroom, shut the door and have a shower, because there could be cameras as well as microphones in the room. After a while, it was just so hot, and you get a bit more blasé, and you think, "If you are going to get a buzz out of this, I don't care," and you didn't worry anymore. But that was part of it. But you just got used to that.

There was an occasion where I was in there – I didn't tell Bob this until a long time after it had happened. There had been a bombing in Iran, and it was associated with the Mujahedin, and we were told not to go anywhere near Mujahedin headquarters in Baghdad, because there could be a retaliatory attack. Of course, other than walking from the hotel to restaurants at night, we never went anywhere other than in UN vehicles. But we didn't have any real control what route they took, and we actually ended up during past Mujahedin headquarters, and we were stopped. Fourteen-year olds with submachine guns coming on your bus is possibly not a great situation, but that is one where I didn't think until afterwards what could have happened. I think it is, again, as I say, the adrenaline was pretty high. They just stopped. They searched the bus. They interrogated the driver, and then they let us go. Obviously, that could have been -

Did you have some sort of United Nations identification with you?

We travelled on UN passports, yes.

How many times did you go to -

Three.

Three times to Iraq, in 1993 and 1994?

Yes.

Did you find any biological weapons?

It is really like a treasure hunt for jigsaw pieces. We didn't find any conclusive evidence, but we found evidence that once it was all put together, started to paint a picture. And then, eventually, if you remember what happened was – After Saddam's son-in-law defected and they found all of the material on his property, they put the blame on him and said they didn't know about it. It was all Saddam's son-in-law who had set it up. And yes indeed, this facility had been where they were going to make the things. Yes, this was where -

What were the biological weapons they were going to make?

Is that public?

Yes. I will be very careful what I say now, but yes that can be public now. And they have admitted that they did have these programs, and they have admitted enough to know about it. so, they have admitted where they did the research, which was another name – Maybe, that may not be public, but a university that we visited, which most of the university facilities would make you cry. They were really poorly equipped.

Except for the one.

Except for one that we went to.

Microbiology?

It was a microbiology department, and at that time, actually CSIRO had some great equipment, but by golly, I wouldn't have minded this lab. It was beautiful. It was really well equipped, and the person who ran it had the right type of expertise.

What was the organism?

They looked at anthrax. They looked at camel pox, which was a bit weird. There is a reason they did it. I don't think it was valid, but there was a reason they did it. There was another organism they looked at, and I have gone blank on it.

Were they all viruses?

No. Some were bacteria. Some were viruses. They did both. They didn't have very much success with the program. I don't think they got very far.

It wasn't weaponised, then?

They did try to weaponise some of it, but not successfully, no.

In 1993/1994, you were on the Iraq visits. Was that simultaneously with chairing the western group expert meetings in Geneva?

Yes. I was away a lot.

You were away a lot for 1992, 1993 and 1994?

Yes.

In 1995, were you still doing that?

I wasn't. I was still doing the western group stuff, but not Iraq, no.

UNSCOM was only 1993/1994?

They asked me at the end of the 1994 to lead one of the teams in. It was a monitoring team, but the monitoring teams went in for six months. I still had two very small children and a husband that told me he would change the locks if I was away for more than four weeks, so I decided it probably wasn't the right thing to do, so I didn't do it.

Was Bob still working for the CUB?

No.

Was he working for CUB all the time?

All the way through, yes.

Until you went to Armidale?

A year before we went to Armidale, he left.

So, he had a stable job?

Yes.

I think that what Terry has been discussing a bit about, is that you learnt management on the job, in a sense?

Yes. Look, I did learn management on the job, but I think actually CSIRO did leadership development extremely well. At least when I was there. I have no idea what it does now, but the courses that Jane and Bob led were superb leadership courses. And they were very good – A big component of it was self-awareness. I think that that is something that is really important. It was recognising your strengths and your weaknesses, and how do you deal with that, and I think that I learnt that through Bob and Jane.

Human factors in management? Was that one of the things that you -

I think that was a very big part of, yes. Tom knows this. When I became chief and Greg became my deputy, Greg Simpson, I have always said to everybody that I think that Greg and I made a great chief, because we complemented each other. Greg is a very, very bright chemist. Very bright bloke, but his strengths and my strengths were different. We complemented, and I think that was something that I started to learn. Who is good at what? How do you use the skills you have got? How do you delegate when you can't do it all yourself, and when maybe you are not capable of doing some aspects of it? But also, learning –

I think this came from Iraq, and this is a story I can tell you. Learning to be very firm but fair in what you do. There was one trip that we did, and we had to fly by helicopter to get to this spot and there was a curfew in Iraq. The helicopters weren't allowed to be in the air after a certain hour. Not long before we had gone in, one of the UN helicopters was shot down by western troops because it was in the air past curfew. Needless to say, everybody, especially the helicopter pilots, were very nervous about this.

When we arrived at this place, we were told we had until a certain hour and if we weren't back at the airstrip by that hour, we would be staying there overnight. It was actually in a place where – another place where I should have been more frightened at the time, because we had Baghdad based Iraqi minders with us. Military ones. And we had some of the locals, and the people in that part of the country didn't like the people in Baghdad at all, so there was actually internal Iraqi strife, and quite a lot of weapons very openly on display at the time. That was a fraught occasion, anyway.

We got to somewhere, and I was leading a sub-team. I had to go and investigate facilities, and the doors were locked, and we had been told – I don't know if it is true, but I had been told that if facilities are damaged, the caretaker of that facility has to get it fixed and they have to pay for that themselves. None of them had any money. I said I wanted to get in, and I was told they had lost the key, so I said, "I can wait, but I can't wait too long, so why don't you go and look for the key? I will give you ten minutes and come back." They came back in ten minutes and said, "No, we can't find the key." I said, "I can only give you another five minutes, and then I am going to ask the military that I have, the western military, to break the door down because I am going to go into that room. But I will give you five more minutes." Whereupon they produced the key, and we went in and inspected the facility.

But knowing that the caretaker had nothing to do with the program other than what he had been told to do. Knowing that he would be punished if we damaged his facilities. I could have just had the door broken down, but a lot of people would have suffered who shouldn't have suffered, over that. But they did think that they were going to get away with it. They always would try on all the teams, but there is no doubt that they tried me on more because I was female.

And so, actually just learning to be very firm, and that is something I have always tried to do. We had some fun, as you know Tom, when I first became chief, because we couldn't afford to pay everybody. But I actually, after we had to go through a whole redundancy process in CSIRO, had people thanking me for the way it was done. Not for the outcomes, but for the way it was done. Trying to treat people with respect even when you know they are going to

be really unhappy with what you do. I think I learnt some of that – I think I honed that in Iraq, but I suspect I learnt it from Bob and Jane in the first place.

I must have nominated you for the Australian Graduate School of Management, for scholarships for women to attend the development program for managers. Did you actually go to that? You can't remember that? It was at the University of New South Wales. We nominated you, but you may have been taken up with visits to Iraq.

It could be, but you did send me to Harvard at some stage. Was that you?

No.

I did get sent to Harvard. Murray Cameron and I went there.

But I think in the division, we had Bob and Jane come down to do some courses, and we probably would have sent you to -

I went to several of them. No, I think I know what that one is. I think that is the one – There was one where I thought it sounded great, and I came to see you and said, "I would like to go to this," and your comment to me is, "Annabelle, I think it is time you stopped going to courses and actually started just doing it," which was what I did. Which was actually good advice.

But I did nominate you.

Yes. Okay.

But you didn't go?

No, I didn't go to that one.

I think we will now come back to the Division of Chemicals and Polymers. This is my recollection of the course of events that happened. We had Peter Milic, who was our commercial manager, business manager, and he decided that it was time for him to retire, and Greg Simpson had just been finishing up his MBA and was thinking about moving from being an organic chemist to taking on a more managerial role. He had already been the program manager of the synthetic chemicals program, or the biological chemicals program. He was very interested in becoming the business manager of the division, and we had to get a new person to be the program manager of the biological chemicals program.

In those days, most of these positions in CSIRO were tap on the shoulder positions. Whether that was a good thing or not, I don't know, but that is the way things were done. I decided that I would ask you if you wanted to be the program manager of that group. Mainly, because it was my opinion that they could do with some biological input into the program anyway. Secondly, because I didn't think there was anybody else within that program who would be able to be the manager of it once Greg left. Because there were a number of people in the program who were extremely good scientists, but none of them showed a lot of interest - the senior people - showed a lot of interest in management, and the one more junior ones who eventually became very successful managers, were too junior.

Can you tell me a bit about your reaction to that sudden change of your career from being an international biologist looking at biological weapons in Iraq and talking to people in Geneva, to managing what was probably the biggest program in a CSIRO division?

I think I always looked at the weapons control work as being really interesting, but not a long-term career. I mean, it was a project that was working on – I had to think about what I was going to do next. Actually, at that time, I was thinking, "Is it now time to move on from CSIRO?" This happened to me twice in CSIRO where I thought it is time to start looking elsewhere, and then getting offered something that gave me something to get my teeth into. Which is why I was really chuffed that I was offered it, and very happy about it. It did give me the opportunity to do more of the people management. As I say, from the biological weapons work that I had done, I realised I did enjoy that kind of thing, and working with people a lot more. So, that was a really great opportunity for me, and I did enjoy doing it.

The Division of Chemicals and Polymers had some very, very good scientists in that program. Some of the top organic chemists in the country were working in it. How did you get their acceptance? Were there any difficulties?

I think there were some that wondered. Andy Liepa I think – If I can give an example of a very bright organic chemist. But like a lot of these people who are totally dedicated to their science, and really anything that any manager says, you only obey it as much as you absolutely have to. So, whether anybody else would have – he would have felt differently, I don't know. I never had any problems with Andy, but I think that he thought I was a light weight, and in terms of science I probably was. But most the others, I didn't have too much trouble with.

There were occasions, again, where there were hard decisions that had to be made, from that position. One of them, there was a scientist – I am not going to name names, but there was a scientist who was very well connected into industry. Often did projects for industry. Didn't always talk to the lawyers before he did the projects for industry, and there was a little bit of – There was quite a high risk with some of the things that were being done. He, again, very dedicated to the science, but thought that most managerialism, and certainly all legal issues, were beneath contempt and not to be taken notice of. I actually put in somebody else as the project leader of that project and put him in as chief scientist. I think it is fair to say he was very upset about it. He saw it as a demotion. After about two weeks, he came to see me and thanked me, because he doesn't have to do any of this rubbish stuff anymore. He can concentrate on the fun stuff.

Again, it is a matter of trying to explain why you are doing something. Trying to, as much as you can, preserve people's self-esteem as you are doing it, although sometimes you can't. But being very firm that you are not going to back down from it, and then giving them a chance to see what happens.

There was another one where we did that, where we had a project where we knew – I can't remember the exact one it was, but it was one of the spinout companies. I can remember which one now. We really needed to push on with the science, so I closed temporarily another project and I moved staff over. Tom, as you know, in CSIRO, if a group leader surrenders staff, it is usually because they don't want those staff, and that was really the

feedback. “I thought that people liked what I was doing, so why are they letting me go, and why are you putting me on this program?” And explaining, “It is because you actually are well regarded, because this project is important. We hope once we have done what we need to, to get that to the stage we need it to be at, you can go back to the project you had, but we have to do it.” But a lot of push-back.

Again, just being very firm and saying, “No. It is going to happen.” And then, after that happened, and the technology spun out, I started to have people knocking on the door saying, “Next time you do that, can I be one of the ones that is on the project,” because they saw it as a reward at that stage, not as a punishment. So, just trying – Again, being firm but trying to be as fair as you can.

You were managing the DuPont relationship.

Yes.

How did you enjoy that?

I loved that. That was really good. I didn’t have any problem with the DuPont people. They seemed to accept me right from the beginning, that it was fine. I wasn’t a chemist, but I was forgiven for that.

In the DuPont area, in Wilmington, they were a multidisciplinary lot anyway.

They were, yes. Of course, because I had been associated with the program as a member of the program team before I had become the program leader, I knew Leo, for example, extremely well and got on well with Leo. And so, that all helped. But no, the DuPont project was – The DuPont project, I think, taught me something that has been useful in other areas, including in the universities. I remember one time we got a phone call to say, “Stop what you are doing, tonight, and tomorrow morning first thing, we will have a phone call and talk about where we are going, because another company has got a compound with the same modus operandi and they have actually just taken it -”

I remember that.

So, it just stops like that. And when you talk to academic scientists and say; if you are doing research and it is dead - and it is meant to be applied to some use, and it suddenly becomes obvious it is a dead-end for whatever reason, stop it and start something else. Of course, it is a foreign concept in a university setting, but it is something that was very much a part of what we did.

I remember that incident well. We had to not mention the work, and I think we had to destroy some records as a result of that.

Yes. I think we did.

It was a very troubling, disappointing time, because my recollection is that our compound was a very highly active compound and was probably the one that was most likely to end up on a commercially -

It probably would have been better.

But we couldn't do it.

Yes.

It was the result of a DuPont person examining the patent literature extremely carefully and finding some reference to this compound in an obscure part of the patent.

Before we leave this, Tom, can we just talk a little bit about what you did in terms of developing CSIRO's relationships with clients, particularly clients in industry, while you were program manager?

I think it was a matter of making sure that we were always in touch. There were no surprises with anything that we were doing. That any areas where there looked like there would be problems, that we addressed it very quickly and discussed it with the clients to make sure it was all right.

Can I perhaps give you an example of the sort of thing I am thinking about? Peter Robinson, when he assumed a management role like this, said that he actually went into Collins Street where all the big miners were, and wore out a lot of shoe leather walking up and down Collins Street and knocking on doors, and gradually being let in, and talking to progressively more senior people, and developing relationships. Did you need to do anything like that?

We did some like that. I know not long after I got that role – This was a very well-regarded group, that organic synthesis group. It was very well known.

And had lots of good clients.

It had lots of good clients. It had a very good reputation.

It had DuPont and NuFarm

But very well regarded. I think this is the thing that is important. At least the two predecessors to me had made – I won't look at Tom now – But Tom and David both made sure that this division always delivered what people wanted, but always delivered excellent science. It is not always done. I won't say any more from that, but that was always the case. So, a really well-regarded group.

Not long after I took this role, I actually had a phone call. It wasn't me initiating it in this case, but I had a phone call from another very large multinational saying, "We know you have worked for DuPont for years. We know they are not forgiving, so the fact that your group has worked with them for years, must mean you are good. When are you coming to Sydney next? Can I meet you?" I was in Sydney frequently because we had staff here as well. Meeting with that person, and it probably took nearly two years of courting, before we finally got a contract from them, and it was a tiny contract. But eventually, it led up to something much bigger. As I say, in that case, I didn't initiate it. It came to me, but then it was really a huge amount of effort, but worth it in the end.

And you saw it as your role as program manager to take the lead in developing that client?

In developing a relationship but making sure if ever we were discussing science - and I have always done this – is to make sure you take the person along that can discuss the technicalities as well.

I think that particular project was one that started when Annabelle was the program manager but wasn't completed until she was the chief.

That would be correct. It was very long project.

It was a project that took a while to develop. It was also the case that Greg Simpson, who was the business manager of the division, had been the program manager. Both Greg and I had very strong links with what was then called PACIA, which was the Plastics and Chemical Industry Association, so the division was quite well known to the industry. So, it wasn't like the old Division of Tribophysics when an incoming person had to go and develop relationships. I think Annabelle's task was to make sure that the relationships were continued, and grasp new opportunities as they came along.

And nurtured, yes.

Could I just ask you a bit about; both in your role within the water treatment group, but also your role as the program manager, and then as the chief, what was your attitude to cooperative research centres?

Do you have much to do with the CRCs?

Some of them, yes. Early on when I was in the water group, there was the water CRC that was set up, and we were the – I don't think we were a member, but we were, sort of, on the periphery. I can't remember.

I think we were a member.

Tony was part of that. My group wasn't, but Tony's was. That wasn't one of the strongest of the CRCs, the first iteration of that, and so there was a lot of grief. Because of the way CRCs are set up, if they don't work particularly well, there is a lot of grief trying to get out of them. Whereas with the polymer CRC, that worked really well. ,

I think the time came when we started to look at some CRCs from the point of view of how much money we put in and how much money we get back directly, without looking at some of the other advantages of them. There got to be some push-back around the polymer CRC towards the end of my time as chief, but I still thought that we were getting huge advantage from the connections that we were getting through that CRC. So, it was very much on a case by case basis. How sound was the CRC? How strong was the relationship with industry? What were the likely outcomes, both for Australia, but also for the division in terms of bringing the right people together? Some worked well and some didn't, and that is how I have approached them all.

I think we will have a short break.

Yes.

[Break]

We are back now, going to talk about your experience as the chief of a division of CSIRO. Some time in 1996, the Division of Chemicals and Polymers merged with what was then the Division of Biomolecular Engineering, to for the Division of Molecular Science. I was the chief of that combined division and started a process of joining the divisions together. I think you have maintained the role as the program manager of the biological chemicals program.

I had to reapply for it. You threw it open and so I reapplied.

And at that point, we had now got it to the stage where a program manager's position couldn't be done by a tap on the shoulder. Although, I had been appointed the chief via a tap on the shoulder. At that point, during that time, the Division of Chemicals and Polymers, and then the Division of Molecular Science, was involved with the Indonesian project, and I did some thinking about the Indonesian project before I personally became involved with it, but the division was part of that project.

At the end of 1998, I decided to – Or, the middle of 1998, I decided that I would take up the position of program manager of that, and so the Division of Molecular Science, had to have an acting chief. Albert Mao was appointed the acting chief, and there was an advertisement for the chief of the division. I think my recollection is that you applied for that and Greg was probably the other serious applicant for it. Can you just go through the process in your mind at the time, of why you decided that you wanted to be the chief of the division, and how that played out with you and Greg?

I agonised over whether to apply or not. I don't think I expected to get the role, but I thought that I had to apply for it because I had to let people know that I was interested in further promotions and doing other things. So, I applied for it not really expecting to get appointed. I remember getting a phone call from Malcolm's office saying that he wanted to see me, and organising all of that. I can't remember the lady's name who worked for Malcolm, but she said, "Do you know -"

Aileen

She said, "Do you know why you are coming up?" I said, "I probably can guess." She said, "Good, because I asked Malcolm if you would know why you were coming up and his comment was, "She should do."" So then, I thought maybe that is what it is, but wasn't sure. Especially because I know there was one other applicant on the plane with me and I wasn't quite sure whether they were going to be offered it. It wasn't Greg. It was someone else. But yes, Malcolm offered me the job.

But you had already been through an interview process.

Yes. There was a full interview process.

***Q:** With Bob Frater and others, and Leo Hyde.*

There was Bob. Leo was on it. Bob was on it. Malcolm - I can't remember who else.

No, he wouldn't have been on it.

No, not Malcolm, but Bob, Leo. I can't remember the others. I think there were about four people or five people on the panel.

When we say Leo, that is Leo Hyde, who was the technical person from DuPont Australia.

Yes. There were a few things that were quite interesting. I sat in the tea room in Clayton on one day. Got the phone call. The next day, I went to Canberra. That first day that I sat with everybody, we would all just gossip about things. Went to Canberra. The announcement was made while I was on my way back down to Melbourne. Went into the tea room the next morning and everyone went dead silent when I sat at the tea room, and I thought, "Okay, this is an example of what is to come," because although I haven't changed, people see it as being different.

My recollection is that the Division of Molecular Science was the – Parkville -

Came off.

- came off, and you were left with Clayton and North Ryde.

North Ryde. That is right, yes.

Was that discussed with you?

Not with me, no. I was just told that was going to be -

When you were told – When you went up to see Malcolm, you were told that you are going to be the chief of this division and it was Clayton and North Ryde.

Yes. That was the first I knew about it, and never a reason as to why that was done.

What was the flavour of that interview with Malcolm?

It was a little bit about his expectations and a little bit of advice.

What were his expectations?

It was really getting the place working well together. Keeping on the quality of the research that is going there. Building relationships. That was really what it was about. He told me that he knew I had been talking to Nan Bray, and that if I was going to do this job, it was great to talk to Nan, she was wonderful, but, "Don't you only have female mentors. You make sure you talk to others as well." I assured him I had been talking to others as well. He may not have found out about the other people I had been talking – When I decided, I talked to various people about the job. He told me I had to learn to be more – not more circumspect. It wasn't that. He said, "But you have to be very circumspect about how much of the truth you tell people, because you can't always tell everybody exactly what is going on, and that is part of leadership, of knowing what you can tell people and what you can't tell people." Basically, "Good luck." It wasn't a very long interview.

What, five minutes or an hour?

It might have been half-an-hour. It wasn't very long.

Did you perceive it as supportive?

Very. I always found Malcolm supportive, and like a lot of people, absolutely devastated. I think Malcolm did a lot of good for the organisation as a whole. A couple of things there. I mean, I think Malcolm's tragedy was actually one of the things that made him the chief executive that he was. I know he sent around emails at various times, "Why are you working on a Saturday afternoon? Why aren't you out at the football with your kids or doing something with the kids?" I think having five kid, and knowing that every minute was precious, made him very family orientated, and so that was good for families, but obviously very good for women who had kids.

So, Bob Frater was the deputy chief executive in charge of your division. Did you have a discussion with Bob of his expectations of you?

Not really, because the first official function that I went to after I became chief, was actually Bob's retirement.

So, Ron Sandland became -

Ron came in.

Did you have good discussions with Ron about his expectations?

Not as good.

Not as good?

No.

This is my impression, is that your management style is somewhat more formal than my management style. Would that be right?

I think it was then.

When I came back to the division, the division seemed to be run more formally than it had been when I was the chief.

I don't know whether that is still the case of how I manage, but I think I was more formal then, and I think some of that is a reaction to imposter syndrome and making sure that people took me seriously. Knowing that some of the very good scientists there might ask, be looking askanse. And so, there was the science side of it, and there was the gender side of it, I think, and so I think I was quite formal then. I don't think I am as formal now as I was then. But I was very new at that stage at that level of management.

When you say 'formal', was that both in person, face to face, as well as putting things in writing? Or did you tend more to put things in writing?

I think the latter, really.

That was your perception.

My perception, yes.

What is Annabelle's perception?

I had never thought of it that way until Tom just mentioned it, but I suspect he is right. But I think it probably was mostly trying – There were a whole lot of difficult issues in terms of blending the Sydney site and the Melbourne site and getting people working together, and some of those were quite fraught issues, so I think there was a lot more formality and a lot more documentation of what happened, to deal with some of the potential legal issues that could have come from some of those.

I am thinking about the way that you described your experience on the committees that you were involved with, and you would call a break and take people aside and talk to them face to face. I was getting the impression that was a technique you had developed and worked up as a way of dealing with things. That you were not at all concerned. In fact, you welcomed face to face interactions with people, including in very difficult circumstances. Whereas, some people would actually shy away from that. They would hide behind formality and memos.

No. It wasn't that at all. It was just making sure that everything was done properly and documented properly. I didn't shy from that. I will give you two experiences. Sometimes, I forget the second one after I have said the first one. The second one is redundancies.

The first time I talked to the entire division just after I had started, and it was telecast up to North Ryde. I had been in the division for quite a while and I had a lot of good friends who I got on very well with. I can name it. John Tsanaktsidis came to see me after my talk. He sat down in my office – that would be your office. He said, "Okay, you just said this, this, this, this, and this." I said, "No. I said that and that, but I didn't say the other three." He said, "Yes, you did, and if you don't think you said that, then you better go and talk to them again because that is what everybody heard." And so, then I asked John to come and see me after all my talks to tell me what I had said to make sure that – I was also more careful about what I said, but I also got him to – Because sometimes people hear what they want to hear, and sometimes you say things in a way that is not clear. So, just getting that, I think was important.

We also had issues to deal with around the finances, when I came in. Around the workshop, as you know, that had been going on for a while. Where we needed to lay off some staff. I know that there are places where that role is delegated to the people in line management. I felt if I had to make people redundant – particularly if you look at something like the workshop that we had. Some of those people came into CSIRO as presumably 16-year old apprentices. They might have been there for a very long time, but they were probably still only about 45. They had a lot of time to work. And saying to them, "You have actually given great service to CSIRO. There is nothing wrong with your work. We just don't need you anymore." I felt – although I hated doing it – that it was my responsibility to actually be the one to tell them that.

When we did the logistics - By this time, I had put Greg in as my deputy. I have huge respect for Greg Simpson. He is a really wonderful man. There was never any problem. Although he didn't get the job, there was never any resentment. As I say, I think we worked closely together. We sat down and said, "Okay, these are the number of people we need to talk to about what is going on. This is how we will do it." Greg will talk to half. I will talk to half, so by the end of the day, everybody that was in the affected groups, knew that they either had a job, they didn't have a job, or they had to apply for their job. The only reason I didn't do it face to face with everybody is that I couldn't have done it all on the one day, and I don't believe that people should go home at night panicking about something like that. So, I don't shy from that. I hate them. I hate the conversations, but I don't shy away from those conversations, because I think you owe it to people.

It was the case that CSIRO as a whole from about 199 – by the time Annabelle became the chief, the nature of external earnings of the organisation started to change, and the amount of private money coming into the division, which was quite high pretty much all the time I was the chief, suddenly started to drop. So, the division got into – and the organisation. Not only the division, but the organisation got into some financial trouble, and Annabelle was the -

I was the lucky bunny, yes.

Let's talk about – You mentioned that Malcolm had a conversation with you about what he expected from you, what were his expectations of the chief of the division. It wasn't called Molecular Science. It was called Molecular and Health Technologies.

It was. I think that is it.

Did you have regular conversations with him, and did he give you ongoing advice?

I am trying to think of the timing, because he wasn't there – He then got quite ill, and so no.

And then, Colin Adam -

And then, Colin Adam.

- was the acting chief executive. Did you have discussions with Colin? What was your relationship with Colin?

I feel I had a good relationship with Colin, but I wouldn't say I met with him frequently. Not that I can remember. Most of the conversations were with Ron.

Some time in that period, Malcolm died. Colin became the acting chief executive, and Geoff Garrett was appointed the chief executive. So, in 2001, I think Geoff Garrett came as the new chief executive of the organisation. What was your reaction to that? How was that news received amongst the chiefly class of the organisation?

I think initially Geoff sent emails to everybody saying that he was looking forward to coming. He was looking forward to catching up. I think it was pretty positive. I think people thought

that he was a people person, and this was going to be quite good. I will leave it at that, if you like, for the time being. Keep going.

In the end – This is now, once again, when my career and Annabelle's career merge again. I came back from Indonesia and Annabelle very kindly gave me a position in the division while I found something else to do. I enjoyed that. The atmosphere in the division was very positive, and I think it was all going quite well, and then I left. Annabelle had a link with Swinburne through the bioreactor work, and we had a joint appointment between Swinburne and CSIRO, which didn't work very well.

No.

But we knew the senior management of Swinburne very well, and an opportunity came up for me to go there, and Annabelle supported that for a while. During that period, the organisation started to get into some turmoil, it seemed to me. What was your impression of those years of Geoff's, when Geoff Garrett was the chief executive from about 2002 onwards? The length of time that chiefs were appointed dropped, and there was much more uncertainty, it seemed to me, about the future of the organisation. What was your impression from right within?

I think the thing that started to change, is that there was a very – Building the trust between the people who had been in CSIRO and Geoff and the new team that he built around him – The trust didn't build particularly quickly, and in some cases, I don't think the trust really built at all, which is not a good place to be. Whether that was the reason, or whatever, there got to be a lot more centralisation of things that were happening. If I can use an example of DuPont, because that relationship had been our relationship, Clayton's relationship, for so long and we knew the people. They knew us, and it was a very personal relationship. And then, as things started to change, the ruling started to come down as; actually no, the business lead for all of our relationships will be in the group in Canberra.

Was it the group in Canberra or the group in Sydney?

No, it was the Sydney group, sorry. Look, it was encroaching on territory and it was jealousy. There were all sorts of things I am sure, that came into it. But, basically, if you think that you have got a good relationship with someone, and it is relating to a good business relationship, then you don't want to see somebody step into it. Especially someone who may not know the nuances of that relationship, and there were lots of nuances. Knowing how to deal with the different people.

Just thinking about that, especially since you as the program manager of that program, knew DuPont better than anybody else in the organisation at the time.

Absolutely. Yes, and you knew the foibles of all of the people there, and they knew all our foibles. I will give you an example of that. I think you were there at the time. Were you there when Graeme gave his presentation to DuPont and dropped all his lead acetate sheets?

I certainly was there.

I mean, if it was a relationship that wasn't working well, you would be absolutely terrified that your main customer would walk out the door because your main scientist has dropped their lead acetate sheets, picked them up in random order, and put them back on the overhead and said, "This is this stage of the synthesis. This is four steps before," and they all just burst out laughing, because they knew how good he was, and his presentation. So, it worked well. It can't work if you don't have that relationship. So, those kinds of things started to erode, I think, some of the trust, and the trust wasn't great anyway.

Can I just get you to clarify. Geoff Garrett influence the science of the organisation and also influenced the relationships between CSIRO and companies and government. So, more on the commercial side.

More on the commercial side.

Are you talking primarily about that, the commercial side of things?

No. I am not. I am prepared to go along with this one. Let's talk about Flagships. Flagships were initially discussed within that group of chiefs and the senior executive, around major Australian problems, and if CSIRO can't solve them then who can solve them? So, solving a problem was the rationale for setting up Flagships. Very, very quickly, it became; what can we get money from externally and they are the problems we will solve. Now, if you can get money externally, a lot of people can do that work.

Why did that happen, Annabelle?

I don't know enough, Tom, to say why it happened. I only know the perceptions that I had of it. I don't know whether – The political environment was changing. There was no doubt about that, and whether there were political reasons why CSIRO had to actually make sure that there was external funding for everything that it did, and it couldn't actually do public research that didn't have any external funding, or whether that was a perception that was being held within parts of CSIRO that were driving us to behave that way. I don't know which of those is correct.

Are you able to recall the names of the people who were involved in those decisions that you are talking about? Apart from Geoff himself. Did you perceive people as being part of the driving group?

I think there was a very small group that was involved with that, and I think that there were – In terms of Flagships, I thought there was going to be discussion, again, amongst that senior chiefs and above group, of what would be funded and what would not be funded. There seems to have been a meeting of a small group, which I think were the deputy chief executives and Geoff, and the commercial. I think that possibly, I don't know for sure, a couple of the commercial people were involved – who decided where to go.

During that period, the government issued a statement as a result of Robin Batterham's investigation into the innovation system. The government issued a statement and CSIRO didn't get any money, and that was perceived by some people as a crisis for the organisation. My understanding is that the Flagship program in some ways was an attempt by the senior management of the organisation to convince the government that the organisation was

doing something. In fact, that was successful because the organisation got some extra money for the Flagships. In your recollection of that time, did you see the fact that the organisation didn't get money, and that statement, as a crisis?

I actually interpret it more as being an oversight rather than a crisis. I actually think that that is not really what Robin intended. I think that he thought that there were things that needed to be done to boost the system, and because he hadn't worked on a part of the system – hadn't mentioned a part of the system that actually was very innovative, I think that was seen as being a kick in the teeth. Whereas, my interpretation is Robin thought, "This part works, but boost this part." So, different interpretations, and I am quite happy to say my interpretations might be totally biased by subsequent events, but that was my feeling of it.

There are obviously, presumably, meetings of the – it was called the executive council, or something.

Executive team, by that stage, I think.

Executive team. What were the nature of the discussion in that executive team about the direction of the organisation through the Flagships? And, can I ask you a particular question? Somebody must have had a choice of where the money went, so my understanding is that the decision that was made, or the management arrangement, was that the divisions got some money, and the Flagships got some money, and there was a matrix developed where people had to negotiate between the Flagships and the division as to where resources finally went. The Flagships had no capability. In order to get anything done, they had to negotiate with the divisions. Was there a discussion that you can remember about where the money – which was the best way to allocate the money?

Not that I recall. It was dictated, as I recall it. It wasn't discussed. I think that caused a lot of discomfort to a lot of people. Change will often cause discomfort, but I think in this case – CSIRO had tended to work collaboratively. Sometimes very well, but sometimes not very well.

Across divisions.

Across divisions, but when there were the relationships there and when there was the need, I think we worked quite well. I wouldn't call that a matrix. I would call that a collaborative relationship. I think the matrix were brought in as a way of trying to force those collaborations, and I think the impression I got is that a lot of people no longer quite knew where their home was, if you like, and people when they are working – They like to know their home. Their work home and their private home, and their work home is this group that they are with. Suddenly, I think all that went away, and I think there was a feeling of displacement. I think that that made a lot of people feel very, very uncomfortable. Formal matrix arrangements, I am very suspicious of them, because I do think there are other ways you can get people to work together.

Was that concept, the matrix concept, discussed between chiefs, to your knowledge?

It was discussed between chiefs.

Are you prepared to tell us what your chiefs thought?

No. It was discussed informally amongst chiefs. I can tell you that. Informally, very much so, and a great deal of concern about it. Again, partly; who calls the shots? Is it the leader of the Flagship? Is it the chief? It was a threat to the position of chief, so some of that was coming from that position. But there was also this concern of; how do you make something work like this when it is getting far more complicated and not obvious that there are clear lines of control, and clear ownership units, if you like?

Annabelle, when you started off being the chief of the Division of Molecular and Health Technologies, or whatever it was called, your task was two-fold. It was to make sure that the science in the division maintained its excellence. Secondly, to interact with the customer base of the division to make sure that the division had enough external earnings. But not only that, to make sure that you are doing things that are eventually going to be useful to customers. When the Flagship started, how did the job of chief change?

It change quite dramatically, because particularly that – There were two things. One, the pressures to deliver outcomes for milestone payments shortened, and if you do that – I can understand why you have to keep that pressure up, but if you are not very careful, it leads to a situation where you start to do known projects with known outcomes, and the quality of the science degrades. That takes a while before you really notice it, but it absolutely does happen, and we know it happens because we have seen it in other places. But the other side of it, it then became difficult to know who was in charge of the relationships with customers. Who would call the shots?

You talk about formalising things, I mean this is where some things got a lot more formalised, where I was asked at one stage about; we need to do some sort of a legal review of – not coming from your group. Coming from the commercial group. Around Dunlena and what were the risks around Dunlena? I said it only has two directors, and I am the chair this year, and Leo will be the chair next year, but I will be the chair the year after. The risks aren't great. "Oh, no. It is an external entity. We have to be very careful about it." So, starting to look at some of these things that were based on trust between, let's face it, you and Leo, then me and Leo, and between the whole organisation and then starting to put it on this very formal basis. That is not to say – It was already on a legal basis that was quite formalised, but managing relationships then was taken out of the control of the people that knew it best.

So, who was meant to be doing what with some of the big customers, became a lot more hazy, and lot more difficult to know exactly what you should or should not be doing. I think that became a bit of a problem.

Geoff Garrett became the chief executive in 2001, and we talked about some of the ways that changed your experience as the chief. Looking back on Geoff, what do you think his main contributions to the organisation were? There were some positive contributions. What do you think they were?

I think the concept of tackling the big problems, the Flagship problems, that was a good idea. I think there are probably others, but that is the biggest one of what is a very good idea. I

think it fell down in implementation, but I think that that was actually starting to say; we do need to bring money in. There are various things we have to do, but we actually need to show that we do have a very positive effect on helping to solve some of the problems of the country. I believe we have always done that. Sorry, they always have done that. But sometimes it wasn't as overt as maybe it could have been, and I think in that environment that was being perceived at the time, whether it existed or not, but that political environment that was being perceived, a really obvious demonstration of how CSIRO could bring all its resources together to solve some very big problems, I think that was actually very positive. As I say, I think some of the implementation left something to be desired.

It seems to me that what you're saying is correct. That one of the roles of the CSIRO is to be able to assemble the teams that are needed to solve major problems facing the country. In some ways, this applies better to environmental problems. Problems to do with mineral exploration. Problems to do with the management of the 200-kilometre ocean exclusive economic zone around the coastline. In the discussions that you had amongst yourselves and with the chief executive, how was that perceived to be assisting secondary industry? What were the major problems of secondary industry that people perceived, and how was CSIRO going to solve them?

I don't recall that that was a big part of the discussion, to be perfectly honest, Tom. That is where some of the decisions around what to support and what not to support came in. It was supporting things where there was money up front to help. It wasn't actually setting up things for the longer term or for innovation that would result in new industries, new ways of dealing with things, or in ways of saving money. I mean, some of the ecological problems that we have got that are very obvious at the moment, are costing us a huge amount of money, but they don't have a cashed-up constituency to pay for solving them in the first place. And they are the problems that, to some extent, I think CSIRO should be looking at. Not to the exclusion of supporting existing industry, but it should be part of what CSIRO does, as well. There is no one else to do that kind of work, really.

During the 2000s, what is your perception of what was happening in Australia to the manufacturing industry? I am not talking here about food, very much. I am talking more about the car industry, and high-tech deliberately transformed manufacturers. Your clients.

Our clients? Our clients were deserting the place, basically. Many of them. But in nearly every case, it is policy. It is tax policy. It is all sorts of policy decisions that meant people were starting to move away. It wasn't the science per se, but they were moving away. But there were areas where Australia had been doing very well in terms of new industries. I am thinking the medical device industries, particularly, and I know we lose them offshore. But again, for policy reasons, we lose them offshore as much as anything else. I think there were new industries that could have been built up, but that perhaps weren't because they weren't getting the funding they needed or the policy environment that they needed to actually establish here. So, we lost the old industries like the car industry, and we didn't really capitalise well on some of the newer very high-tech industries that we could have been building up at that stage?

How much could CSIRO influence that? I think it was a broader discussion. I think we had a role, but on our own, I don't think we could have influenced it. But I think we could have been more of a part of the discussion, probably, than maybe we had been.

You were appointed as chief in 1999. You were appointed for a five-year term that ended in 2004. Is that when you left?

No. At the end of 2004, I offered to leave. I said that I felt things were changing and maybe I wasn't the right person in the job. I was told that, no, they would like me to reapply, and they would see what happened, but they would do a 360-degree assessment of my performance, as well as everything else.

Are you happy to say who you had this conversation with?

Warren King.

He was the deputy chief?

He was the deputy chief, or whatever it was called at that stage, yes. So, I went through that process. I was told that my customers all thought that I was wonderful. My staff seemed to like me, and they would reappoint me. That was 2004. It must have been 2005, very early 2006, I was told that they were going to bring Parkville in, and that they were going to throw the role open between me and Graeme Woodrow.

Graeme Woodrow was already the chief of that division.

He was the chief of the other division.

He had taken over from Richard Head.

Yes, and his term was about to expire, but they put him up – They made us compete and he got the job and I did not, and there was nothing on offer for me. So, at that stage, that is when I then left.

So, you had been given a five-year extension from 2004? Not a three-year.

No. It was five years.

Another five-year appointment.

Yes.

Can you describe the process that took place? Had they decided to – Was the sequence of events that somebody decided to combine the division, Graeme Woodrow's division, which had Parkville and also Adelaide -

Adelaide as well, that is right, yes.

So, someone had decided to combine them again?

Yes. I was rung and told by Warren they were going to merge the two divisions.

Were you involved in that process of deciding to -

No.

So, that came from the top?

That came from on-high. That was decided, and I must confess, I assumed that this was when Graeme left, because I had just been renewed and his contract was about to run out, and then I was disabused of that and told; no, I would be competing for the job against Graeme. And so, that process was -

When you say you were competing against Graeme, they threw it –

It wasn't thrown open. It was just between the two of us.

Who conducted that process? Was Geoff involved in that?

I think Geoff was there. I am pretty sure Geoff was there. Warren was there. Graham - Foursight Partners – Mitchell. There was another one. I can't remember who else was on it, but they were on the panel, and I didn't get the job.

Did you receive any explanation as to why those two divisions were being combined?

No. Just; we think it is a good idea to pull the two together. There are synergies, and it is a good way to go forward, and that was as far as it went.

Geoff thought, did you say?

No, I said that it was decided. I don't know who decided.

Did you leave CSIRO straight away or was there a transition period, or after that meeting Graeme became the chief and you weren't?

No. It was actually a very difficult period, because that decision was made but the decision was made that the merger would come into effect on a certain date. I can't remember, but I think it was probably about six months, so I was a crippled chief for the next six months because everyone knew that I was on my way out, that Graeme was coming in. It put a lot of people in a difficult position, because that group that I had with Paul and Keith and Gerry and the like, we were a fairly close-knit management team. You know how it worked in that division. People got on extremely well together, and they would come in and say, "Annabelle, we are going to do this, but if it is all right with you, we are going to ring Graeme to make sure he is comfortable with it." Well, they had to do that, and I had to say it is okay to do that.

That was a departure from past practice, wasn't it? Past practice in CSIRO was to announce that the divisions are going to combine, and it is going to be next week, or tomorrow.

Yes, which is the way to do it, because as I say, it was very difficult. -

Why did they depart from that practice?

I don't know.

During that six months – after the end of that six months, you were out?

I was out. No, I still had a job. I was told, "Here is your job. What do you want to do?" I said, "What are you offering me?" "No. You tell us what you want to do?" The other person on the interview panel was Rod Hill, and that is when I then had a discussion with Rod to say, "You all effectively made me redundant. I expect you to make me redundant, and to do it properly."

Did he?

Sort of, except that, again, normally, at least in our division, if we were making somebody redundant, we would provide them with access to career advice and placement. When I finally mentioned it to Rod, it was – I don't know – two or three weeks before I left, and he said, "We haven't got to that stage yet," and I thought; you have had nearly six months and I am about to go out the door, and it is far too late for that. It diverted from what we would, at least, have normally done, and I suspect the whole of CSIRO would normally have done. So, it was a process that left a pretty bitter taste in my mouth.

To be honest, the reason I offered, "I won't reapply for the chief's job," in 2004, "I will just go away at that stage, if you don't want me to continue as chief," was because I think I was starting to feel that I didn't fit anymore in the organisation, but when they said they will put me through the process and if everything is favourable they will reappoint me, I had been in CSIRO for quite a long time by then, nearly 16 years, and I didn't think anyone else would employ me. So, if someone says they will keep paying your salary and you are too scared to jump, then you stay. That was a mistake. And so, I think it was the right thing for everybody, to do that, but I don't think it was done well.

Did you leave CSIRO without a job?

No. I went straight to -

During that six months you negotiated a position at Bio21?

At Melbourne. Bio21, which wasn't the best of fits for me, I don't think either, but I did want to feel that I could go to something else. For my own self-esteem more than anything else. Just to feel that some one else did actually – I must say David Pennington is fairly relentless when he decides he wants you to work for him. There were a lot of phone calls.

Is he still the vice chancellor?

No, but he was the chair of the board of Bio21, and he decided that he needed a chief operating officer who could help to actually set up parts of the institute, and that I should be that person.

How did he know you? How did he decide that you were the person to do it?

I don't know. I think it was just through Melbourne – Graham knew me, of course, through Foursight. Various people at Melbourne University knew me. Various people in the state government knew me because we always worked closely with the state government. I think that it was just people knowing people.

What about John Stocker? Did you have anything much to do with John Stocker?

I didn't have a lot to do with John. I met him a few times mid-my time in CSIRO. I always found him very approachable, but I didn't know – and very encouraging to talk to. He was always very supportive of anyone, I think, that he spoke to, and so I have always respected John. But I didn't know him well, at all.

We will probably go through your Bio21 – You then went to La Trobe University looking after the state government laboratories there. Can you just talk about what you learnt in Bio21? How did that experience help you in your future career? What was your job at La Trobe, and then your transition back to the mainstream of the university?

I think Bio21 got me back into the university system. I set up the financial function for Bio21. I set up some of the external outreach for them. I set up various – We started to bring in patent lawyers to talk to the academics about it, because they wanted to go down that route, and academics have no idea, and I had some idea about that. So, I started to set those things up. But it really wasn't a very fulfilling job. Once those things had been set up, they ran well, and so I left there and went to -

How long were you there?

I was there for about two-and-a-half years.

Quite a while.

Yes. I didn't have a job when I left there, but as soon as I left, I got a phone call ~~from Bio21,~~ from La Trobe, from friends of friends of friends. People who knew that I was in the market, and one of those worked at La Trobe in the risk management area. He arranged to take me to lunch with a few of them to talk about the collaborative project they had between DPI and La Trobe, and they needed to get the scientists actually collaborating together. So that was really my role there, was to get the groups talking.

What was your title there? Were you the chief executive?

No. It was something to do with collaborations. This does not help at all, because this is a CV that was written before I went there. It was something around Director of Collaborations, or something. I don't think I would have got that role if I hadn't been at Bio21. I don't think I would have got it if I hadn't been in the university sector. This brought me into contact with the ag sector very strongly, because it was DPI Victoria and the ag departments at La Trobe. I was very much part of the groups that were looking at building the building. That was actually quite time consuming. The user groups. The interactions between – I think it was called the Department of Infrastructure, or it was then in Victoria, Department of Primary Industries, and La Trobe, to decide what the building should look like. Who would have what? Where would we do it? A lot of physical work around that kind of thing.

Foursight was the chief. Graham Mitchell and others were the, sort of, chief scientists of DPI.

They were.

So, there probably was a link.

I think so, yes. And then, I was there also for about two years. I think I stayed there two to two-and-a-half years, again. I had really got to the stage where I didn't believe I could do anything more. I had another two-and-a-half years. It was a five-year contract, but I didn't see what else I could contribute. I think I got it as far as I could make any difference, and so at that stage, I then approached a head hunter that I knew, and they actually said, "We have got a job, but it closed and we are shortlisting it on Monday." This was on a Friday. "I will ask the vice chancellor if he will take a late application." So, I put in an application for the role of DVC Research at UNE, and then rang Bob and told him I had done it, because he was in New Zealand at the time.

Was he still at CUB?

No.

He had retired?

He had been made redundant from CUB 12 months earlier, and he did probably the wise thing of taking 12 months off before he decided what to do next. He was actually not employed at that stage, at all.

And, your children?

The children were both at Monash. Both at university.

They stayed at university?

They stayed there. They stayed in the house that we had in Mount Waverley, because that was the issue. When I left CSIRO, Lachlan was in year 12 and I wasn't moving him in year 12. And when I left Bio21, I think Nicola was in year 12. Again, I wasn't prepared to leave Melbourne at that stage. So, when I left La Trobe, I was mobile. I was happy to go.

The long and the short of it is, I had no idea whether I wanted to go Armidale. No idea whether I wanted the job. I went for the interview. It was quite a short interview, so I said to Bob afterwards, "You don't have to make a decision about whether to move to Armidale. It was too short an interview. I haven't got the job." And then, ten minutes later they rang and said, "We need your referees," and I got the job. I think the experience working with DPI in Victoria helped me to get that job up there, because the strongest research that we do is agricultural.

You can spin a story around things to say one thing led to another, led to another. So, while some weren't necessarily as fulfilling as they could have been, I think they helped to set me up for the next stage. At least, you can justify it in your mid that way, anyway.

And, was it fun at University of New England?

Yes. It was a good move. When I went up, there had been a lot of problems at the university at the governance level, and I think a lot of the researchers had just decided to keep their head down. And so, while there was good research, there were not good outputs from that research. Money was down. Grants were down. Publications were down. But we are now doing extremely well, and I am very proud of how we are doing. I started that, and then I brought someone in to work with me who is now my replacement in that role. We have really turned things around, and it was a lot of fun doing it.

It is a university that fits with my ethos, I guess, if you like. As I said, my kids went to Monash. They are now in universities here. All Group of Eight universities, and Group of Eight universities do great things. Especially for kids like yours and mine.

Smart, bright kids.

Smart, bright kids who have got a background, who understand what is going on. UNE gives opportunities to a lot of students that have got a lot of other things going on in their lives. They are either from regional areas. Not necessarily well-prepared, or two-thirds of our students are online and they are working fulltime, and they don't fit within normal university timetable. They have to study online just to be able to fit it all in, and UNE has always done that. And so, it is helping people to get to places they wouldn't get if they were dependent upon mainstream, if you like. So, I really like what we are doing there.

But the other thing is, it is very much a country university, and a large amount of the research that we do, again, is applied research. It fits, again, with what I enjoyed about CSIRO. What I have always enjoyed, myself. It is actually making a difference to real problems and helping develop regional communities.

It has got good government support, I think. State government.

Not bad. I think at the moment, all universities are finding it tough, and putting the caps back on student places really knocks a university like UNE far more than – that university, it doesn't make a big deal because a lot of full-fee paying students, particularly internationals, we don't have so many internationals.

Don't you have many international students?

We are gradually increasing. When I first came into the role, it was only 5% of our students were internationals. We are gradually increasing that, but some students don't want to go to regional Australia. Of course, the ones that do go, realise they get to meet a lot more Australians and have a great experience. But yes, it wasn't an emphasis for a while.

You left CSIRO in 2005, and had a role at Melbourne University, and then another role at La Trobe University with the state government involved. And then, came to New England as a Deputy Vice Chancellor Research. You have done all of this without much of a published record in research. When you went to New England, was that commented on? Did you have to build up a rapport with the senior researchers there?

Yes.

How do you go about doing that? You would probably be the least published deputy vice chancellor Research in the country.

Absolutely, I would be, and I think there is – You go back to the comment Malcolm made. How honest do you be with people about things? You don't stress that you don't have a publication record, but I also make sure that people know that doing the research isn't my strength, but I know what is required to do the research. And making them understand that I know what motivates them to do the research, and that I will do everything that I can to ensure that they get the conditions that they need to do their research.

I think most of them came over to my side, as it were, in time, because I wasn't trying to encroach on their area, but I was actually making sure that they got the support. That is where our research has improved dramatically. That is not to say that I am loved by everybody, because the way that we increased the research outputs was to channel the money into the areas where we knew that we would get the outputs that we needed.

When you say you channelled the money, does the university have spare money that it puts into research, or does the university rely on ARC and other external sources?

We get a block grant based on the amount of research that we do. The number of papers that we publish. So that is the research block grant, and then we get the research training scheme which is also based on the number of students that we have. So it lags, and it takes a while to build up. But by taking that money and being very careful about where you invest it, you can actually start to increase your research, and then that pool of money increases as well.

When I got up there, for example, some of the research block grant was distributed to schools, and it wasn't a lot of money to each of the schools. Some of them used it well, and some of them said, "Okay, this is how much money I have got, this is the number of researchers I have got. I will divide one by the other and that is how much everybody will get." It is not exactly the way to encourage great research.

I actually took all the money into my research office, which didn't win me friends, and then I gave it back out to the areas where it would be best used. It wasn't only the successful areas. Obviously, most of it did go to agricultural and environmental research because that was the strongest research that we have got, but we put some money into health, for example, because we need to build what we do in regional health.

Do you have a medical school?

We have got a medical school. We have got a joint program with Newcastle, but we are not strong in research, and we are building that.

There is a hospital in Armidale, is there?

There is a hospital in Armidale.

So, the medical school is associated with the hospital?

Yes. I mean, we would never, ever try to compete with the Parkville Strip. We couldn't. We don't do biomedical research. It is expensive. We do a lot of work in mental health, because mental health in regional Australia is horrific, and it gets worse whenever you have a drought. That is the sort of research we can do. It is cheaper to do, but it is also applied immediately and it helps our communities. So, making sure that the money then was used in ways that built our research outcomes. Obviously, there are people who now get no research money from the centre and don't like me very much.

You went there as Deputy Vice Chancellor Research. Did the university have a research strategy at that time? And if it didn't, how did you build it up? What was the processes you used to develop a strategic plan, as it were, for your research?

I started by talking to everybody. Every head of school, and all of the more productive researchers, to find out what was going on. I identified a couple of people. One who is now my successor in that role, and then started discussing ideas, and then circulating those around through academic board, but also in discussion papers, and working out where we are going to go. And then, taking some feedback on board, but not all of it because, as I say, there were decisions that had to be made. But making sure that we did use all the money we had, because there is not a lot of it up there.

But also, we have always been well plugged in to certain industries, again, and making sure that they were looked after. Meat and Livestock Australia, New South Wales DPI, some of the cattle breed societies, are very big for us, so keeping up with them. The other way, we come back to CRCs again. They have always been a very big part of UNE. Sheep, cows and chooks.

The agricultural CRCs, mainly?

Most of the agricultural CRCs have been based in Armidale, and that is how we do most of the commercialisation of our research as well. UNE is now the second largest earner of industry – of results of commercialisation -

Royalties.

Royalties, of any university in the country. When I first got there, we were first, but then we got the Gardasil vaccine from UQ, and that has bumped us off first place, but we are still second, so we have always done that kind of thing very well. Again, it is maintaining those relationships.

So, you were the DVC Research for three years, and then the Deputy Vice Chancellor. Was that a different role?

What happened was there was a deputy vice chancellor who was the academic side of things, if you like, when I arrived. He departed. I will leave it at that. There were two faculties. My predecessor then abolished the faculties, and so there were ten schools who had to report to somebody, and so he decided he needed a DVC again, so then he put me in as DVC, so those ten schools reported to me.

He was the vice chancellor.

He was the vice chancellor and didn't want ten schools – The ten schools that used to report to -

Can I just get this sequence of events right? Was the vice chancellor the same person, and he appointed you, and so that vice chancellor was the vice chancellor until you became the vice chancellor?

Yes.

And that vice chancellor abolished the two faculties, and made ten schools?

Yes.

What is there now?

I have bought faculties back.

***Q:** How many faculties have you got?*

Three now. So, then he basically needed a senior vice chancellor, if you like. A deputy vice chancellor. I became that, and I was in that for a short while, but I don't have the academic background and I was, again, looking for another job when he called me in late January and said, "I have decided I have had enough. I am going. You will have to -" Almost immediately.

Did he retire?

Yes.

So, he went off into the summer?

Yes. He was there for four years, then he disappeared, and I had to step in.

So, you were the Acting Vice Chancellor?

I was Acting Vice Chancellor, yes. They actually appointed me. I said I don't want to be Acting. If you want me to do it, you appoint me, but you appoint me for the shorter – Six months, or until you get someone in the role. I didn't have any intention of applying for the job. My predecessor didn't really enjoy it, and from talking to him, I thought, "Why would you want this job? It is all grief and no fun."

Why didn't he enjoy it?

He is a very introverted person. He doesn't really like people involvement, and in Armidale, anything that is problematic in the town is the fault of the university. He found that very hard. The newspaper – UNE has introduced trimesters. Students are away. The third trimester is all online. Students are away for longer. My hairdressing shop is going to go bust because of the university. Everything is the fault of the university, and he found that very hard to take. I guess, have slightly thicker skin and I didn't mind it. When I held the reins –

I always said after I left CSIRO, because it was so hard- Everybody said of you, that if they cut you, you have got CSIRO blue blood running in your veins, because CSIRO gets to you. It becomes part of what you are. I always said I would never do it again. And, just before the applications closed for the vice chancellor's job, I suddenly realised that someone else would be coming in to run my university, and I knew I had fallen into the same trap again. So, I had to apply for the job, and I did get it.

Because of what we do, I really do enjoy working in that environment. It is not to say we don't have problems, and not to say we don't have problem staff, but in all the time before I got there where there was a governance fight, we still got five-star ratings for student satisfaction. We have had that for 14/15 years in a row. That says something about the staff at that university when you can do that when the chancellor and the vice chancellor were fighting.

It is a great place and it makes a real difference. When you see students come in who are from regional Australia, or who are solo mums, or whatever, and trying to juggle, and you see them really struggling, and then you see them on graduation day, you think, "This place as got something to offer." I really enjoy doing it. I don't regret it at all. I was thinking of staying another two years, and then I think of the other things I want to do, and then decided – Which is why I am going at the end of this year.

We will have a break.

[Break]

We are just going to finish off this very interesting discussion, Annabelle, by first of all asking you; during your almost nearly decade now at the University of New England, what do you think has been your main achievement in the roles that you have had there?

I think it is putting that university and regional research back into contention. The research wasn't very good when we started, and yet it is very important, because it is very much aimed at improving regional Australia. It is also making sure that - We are doing a big academic transformation at the moment of how we offer our courses through UNE, to make sure we remain relevant to those people who need to upskill.

We have a major problem in Australia in terms of participation in higher education. If you live in regional Australia, your chances of participating in tertiary education are about half what they are if you are in metropolitan Australia, and there has been some research done on the cost of that to the country. We have got to turn it around. But more importantly, not just in regional Australia, but right across Australia, there is a very large group of people who have never had any tertiary education. In the past, for a lot of people, that didn't matter, but the way the economy is transforming, you need that education.

Do you think of yourself as from regional New Zealand? Going from Nelson to Otago, was that like going from regional Australia to a capital city?

It was going from regional New Zealand to what I thought was a huge city, which is in Australian terms a very small city. I have always thought of any differences between Australia and New Zealand are between the major Australian cities and the rest of Australia

and New Zealand, because I think that New Zealand is more like the regional parts of Australia, and the differences are very much that metropolitan focus that comes from, particularly, Melbourne and Sydney that is a different approach. I think that is something that we have got to deal with.

To summarise this, your contribution, or achievement, at the University of New England is to develop the university as a genuine regional university catering for the cohort of students that would otherwise not have an opportunity to do tertiary education. Both the school leaving cohort and an adult cohort who do it either by coming to the university or by doing it online?

Yes.

Plus, to improve the quality of the education, promoting the quality of research.

Yes, and the research aimed very much, in most cases, at improving the communities that our students come from. Whether that is an end productivity around the agricultural research. Whether that is in terms of maintaining the environment, which is also important, because we do a lot of environmental research. The mental health research that we do. That type of thing. They are all very important, and that is what we have to continue to do. We were the first distance education university in the country, and the first regional one.

Before Deakin?

Yes, 1954 we set up as a distance education. Much to the – I think disgust is a word that I could probably use – of every other vice chancellor in the country. They didn't believe that you could teach tertiary level by distance, but we have people right from that time who have gone on, globally, to leadership positions. It is those people that have got to juggle everything else, and it is getting harder for people to juggle, so we have got to look even more at how we give them the education they need to continue to contribute.

Just dipping a little bit further into the question of the quality of the education and the quality of the research. Are they, in your view, separate activities, or are they merged in the persons of the lecturers?

I think a good university needs to have good research. I don't think every lecturer at a university has to necessarily be research active. I think you need to have the research informing some of the teaching. I also think you need to have the research to attract some of the very good staff that you need, but I think that there are places where you can use staff who may be more interested in pedagogies, more interested in the teaching, than in the actual research. But I also think particularly in our area, there is a place for a more diverse staff, and for very much blurring the lines between academics and so-called professional staff, because if you are looking at how you best teach online, there are skills you need for that that aren't necessarily traditional academic skills. They are people who understand how people learn and what is needed to actually get a -

I think that we at Swinburne are experiencing it through SEEK.

Absolutely.

In a way, you have got an extraordinary wide range of experiences of the Australian national innovation system through your own experiences, but also through Bob being part of a large industrial enterprise in Australia. So, if you were now, in 2019, starting from scratch to develop a – thinking about Australia's national innovation system, would you have CSIRO, and if you did, what role would it have?

Yes, I would still have CSIRO, because I think it is absolutely vital to the country. Partly, it is important because of the nature of the industry that we have. You don't have a DuPont based here who has got the money and the wherewithal to do their own research. But also, because – CSIRO is much more broad than that, so if you like, I will look at what I call the industrial side of it and the environmental side, perhaps, separately. But if you look at the research that is done here in terms of boosting the economy or saving the economy money. If you are doing medical research – some of the health research that we have done, including some of the nutrition research that we do, it is not necessarily – It is bringing money in -

When you say, "We" -

I am CSIRO again now. I have got my CSIRO hat on again.

Not "We," the University of New England?

No

We are, "We," the CSIRO.

I will try and go back to that. I still fall into it, Tom. You know what it is like. I think it is an organisation that is devoted to high quality research, but research that benefits the country can only be good for any country, but especially for a country like ours with the industry base that we have got.

If you are at the University of New England, and you are very closely linked with the cattle breeders' association, why can't the University of New England do the work that the animal researchers in CSIRO do?

It is a matter of where you put your money, because you would then have to put the equivalent amount of money into the university. You would have to have people there that could be – I was actually asked a question like this by someone the other day. Would we want to take on Chiswick and I said I would be delighted to take all the ag scientists from Chiswick providing they came with their own money and a guarantee that that money would continue in perpetuity. I can't do it if that is not the case.

And it wouldn't be the case.

And it wouldn't be the case, which is why I don't want to take them on. I think universities have a slightly different mission. I do think that the research is an important part of it, but the research also forms part of the teaching of the university, and so that teaching and that education of the populations – I was going to say the next generation, but it is no longer that because it is all generations now – is very important. I think having an organisation that

devotes itself solely to the research, that has the global links in a way that maybe universities tend not to quite the same, I think that is really important, and I think it would be a loss to Australia if we lost CSIRO completely.

How flexible would your new CSIRO be? Let me ask you this question. In 1990, I was able to say to the Department of Foreign Affairs and Trade, "We will give you Annabelle." I am not sure that the organisation is flexible enough to do that. How much is flexibility and the ability to form teams, and disband teams but keep the people – How much of that do you think is important, and how much has been lost, in your opinion?

I think it has been lost, and I think it is to the detriment. Let's assume that DFAT decided that it needed a chemist to help with the chemical weapons convention, or a biologist to help with the biological weapons convention, or maybe they just needed an expert to help with these things and they had to employ them themselves because there wasn't someone like CSIRO, they would have someone who would be totally isolated who would need to know a little bit about everything, but not in depth for everything. The advice they would get would be not nearly the same advice that they would get from bringing people in who have that background. Bringing in people who work in an environment where they are constantly being challenged in terms of their chemistry or their biology by working with that other group like that, so they are keeping up with what is happening.

I guess, at the time I was doing that work, I always thought of it as the government has a certain budget to do what it needs to do. Some of that budget goes to CSIRO. Some goes to DFAT. Sometimes, DFAT needs the expertise, and it is all government money. It is all one purse. It is not ever really seen as being one purse anymore. I am not an economist, which is very obvious, but I actually think that is to the detriment of the country. I think if you have got people who are employed by the government and you need their skills somewhere, you should be able to put on the best that you have got, to help. I think it helps the entire country when you can do things like that.

Can I just ask you a question that Terry has asked you a couple of times? In this long career that you have had as a scientist, where have you had the most fun? Obviously, at Bio21 and La Trobe, you probably had the least fun.

I think the first three years of being the vice chancellor was huge fun, but some of those problems, you don't solve in the long term and you get to feel like one of those mice. What's more, the running wheel isn't treacle so it is getting harder, and I am getting older and a lot less tolerant, and worse tempered, than I used to be.

But, in terms of the opportunities that have come my way, and the overall learnings, it was within CSIRO. It was the friendships. The depth of the friendships. The camaraderie that existed in the CSIRO that I joined. But then, the opportunities. The fact that people counted in CSIRO. There were the development courses, that you felt the organisation wanted to help you to do the best you could, and so the opportunities came your way. And then, there were the people who encouraged me through those things in my way, and that is all part of that –

There are environments where people try to push their own career to the detriment of everywhere else. I am sure there are places in CSIRO where that happens, but my experience of CSIRO has been more of this mutually supportive environment and development of people. I think that that was something that I appreciated, but also, I did have a heck of a lot of fun. I went to a lot of really interesting things. It has been a fascinating ride, and it came from the opportunities that came once I started in CSIRO.

We were going to ask you about Harvard. Can you briefly comment on going to Harvard? Was it any use? How did it change things for you?

It was very useful. I know I was frightened. I said to Jane, "I can't go to Harvard. I am not up to Harvard." She said to me, "You are going, and I think you will be surprised." She was right. I think when I went there, I enjoyed the experience. I didn't necessarily come away with a lot of respect for all of the people who taught me at Harvard. A lot of the learning at Harvard, which is not a surprise to either of you, I know, came from the people who were on the course with me. But it was the opportunity to be in the same room with those people who came from all around the globe. Who came from government, private industry, academia. All together. All tackling problems, and all bringing different perspectives to it.

It was challenging, and it was some interesting problems that we discussed, but it was also interesting because it probably did boost my confidence in terms of some of the things that we did. Some of the case studies, the interpretations that came from the Harvard lecturers, I didn't agree with. I can give you one example because it was an absolute cracker, where we used Enron as a case study, and, "Isn't it wonderful?" There were two of us that said; actually, this is a company that is headed for disaster. One of those – Bala runs a large construction company in India and has done a lot of work with Enron, because they were heavily into it, and he said, "I know what their model is, and it is a disaster waiting to happen." I said it is a disaster waiting to happen, because Jane and Bob had taught me a lot about KPIs and how they can be abused, and what kind of culture you can set up by that, and I looked at it and said, "This is encouraging all the wrong behaviours, and eventually -" There is sometimes -

High-risk behaviours.

High-risk behaviours. The huge financial return for bringing in money with no looking at how you bring that money in, and it was really obvious. Bala and I were told that we were rank amateurs and we didn't know what we were doing. I think Enron collapsed about three weeks after I came back from Harvard. Bob wanted me to write to that lecturer and say, "Told you so," but I never did. It was one occasion I didn't.

Very good.

Thank you.

I think that we have come to the end of our long discussion, Annabelle. Thank you very much for spending so much time with us.

A pleasure.

Very good.

[End of interview with Annabelle Duncan]