



CSIRO Oral History Collection

Edited transcript of interview with Joanne Daly

Date of interview: 7th February 2019

Location: CSIRO Black Mountain (Canberra, ACT)

Interviewers: Professors Tom Spurling and Terry Healy



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Dr Joanne Christine Daly *BSc (Hons) (Sydney), PhD (ANU), FTSE*

Summary of interview

Dr Joanne Daly was born in Darlinghurst, NSW to a young couple making their way in the post-war suburban expansion of Sydney. She went to the local primary and secondary schools, where 'school was fun'. The community expectations were that she would leave school at 15 but she was encouraged by her parents and teachers to complete secondary school and go to University. She commenced a science degree at the University of Sydney in 1971. In the first part of the interview she talks about her interest in population genetics leading to her first-class honours degree from the University of Sydney and her PhD from the Australian National University.

Joanne talks about her life as a student at the ANU and as a Post-Doctoral Fellow at the University of California at Berkeley. This part of the interview has a discussion about the use of the 'grey literature' in technology transfer in the agricultural industries.

Joanne joined the CSIRO Division of Entomology in 1983 on a short term contract as an Experimental Officer did well and was appointed as a Research Scientist in 1984. She discusses her experiences as a Research Scientist and mother, including using her time on maternity leave to write some of her better papers.

She talks in detail about her experiences as a research leader in the Division of Entomology especially during the late 90s and early 2000s when CSIRO was undergoing great challenges and changes. She spent a year on secondment to the Department of Education, Science and Technology and expands on her views on the way in which CSIRO should engage with the Commonwealth bureaucracy.

In the final part of the interview Joanne talks about her view on the role of CSIRO in the 21st century.

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.

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This is an interview with Dr Joanne Daly for the CSIRO History Project oral history collection. It is 7th February 2019 and we are in an office at CSIRO in Black Mountain. I am Tom Spurling and with me is Terry Healy. Thank you very much Joanne 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 do.

On 29th November 2011 Alice Garner conducted an interview with you Joanne for the oral history and folklore collection at the National Library of Australia. That interview was part of the Fulbright Scholars oral history project and concentrated on your time as a Fulbright scholar. This present interview will discuss some of the same topics that were discussed in the Garner interview but we'll emphasise your career in CSIRO and especially your time as a senior manager in the organisation. So again Joanne thank you very much for agreeing to be part of our CSIRO history project.

We'll start at the beginning, so you were born on 28th January 1953 in Darlinghurst, New South Wales. What suburb of Sydney did you live in? The Garner interview you said that your father was an electrician and your mother a typist and receptionist. Did your father have his own business, did your mother work, what was the family background that we're talking about?

When I was born we lived for two years in North Strathfield in my grandmother's house, my mother's mother's house. Then when I was two my parents moved to a suburb called Ermington, which was a newly established suburb in inner western Sydney, it was a housing commission area. And it was part of that post-war housing boom that was helping to settle young people into housing. Mum was 18 when she had my brother and my father was 20, and then she was 20 when she had me. So they were a very young couple with two young children and we moved to Ermington when I was two, and everybody else around us were young couples with lots of kids, and so that's where I grew up.

I lived in Ermington until I left home at 22 to come to Canberra. Dad was an electrician, mum as I said was a typist. My parents actually were entering their teens or in their mid-teens at the end of the Second World War, which had a huge impact on them. Dad's father - mum's father sorry came back from the war and said he didn't believe in education for girls, despite the fact she was going to Fort Street Girls' High and coming second in the year he made her leave school at 15, at the end of Year 9. And dad he was at a very good Catholic boys' school in Sydney, his father though died on the Burma Rail. And as the youngest boy nobody could support him so he was taken out of school at 15 and became an apprentice. And so they established themselves as a young couple in this housing commission estate.

Dad continued to be an electrician working actually as an employee all his life. Mum went back to work the day I started kindergarten. And so my brother who was six and I was five we'd go off to school together and come home and were the latch key kids at that age. She worked probably most of my life but although we had another child in the family about eight years later.

So you have one brother and another sister?

I have an older brother who's only 18 months older and a sister who's almost eight years younger. She was the only one planned in the family as far as I know.

The environment in Ermington was that supportive, you mentioned there were lots of young families was it like a kids' club?

Oh absolutely, we just used to be thrown out of the house in the morning, as it was the norm in the 50s, during school holidays and we had to come home for dinner and maybe for lunch. We could never wander further than my father's whistle, so my father would stand on the porch, we lived up a slight hill, and he'd whistle out and if we could hear his whistle we'd come running home. But there was a lot of scope for that, and we'd often be roaming around the district with five or 10 kids.

On your bicycles?

Well I actually couldn't ride a bike until I was an adult so I was basically just wandering around and going into the creeks and collecting tadpoles and climbing trees and things.

What about primary school and high school were they all near Ermington?

I went to the local Ermington public school, which was brand new or relatively new. School was good, I actually was quite academic very early on although I was a late reader. I did well at school, was quite studious and so school was fun, I have good memories of school. When I went to high school I went to a co-ed school, which was fairly new at that time in Sydney, and it was a different school [from where my friends went].

A state school?

A state school [called Marsden High, so I went to the local state school and it was a very good school I had a good education. And I was the third year through of the new high school certificate and so New South Wales had just changed to six years of high school, they changed the exam structure and I was the third year through that [new structure].

Did that high school have good teachers?

It had excellent teachers, actually I had some very influential teachers in science and maths. And I think at that time there was a lot of investment in education, a lot of bright kids and I think it was possible for a child like me who came from a relatively lower middle class background to get a really good education.

Did your parents have the expectation that you would go on into education and into university?

Absolutely not. My mother's brother had gone to university but that was the only member of the family who had done so. All the neighbours and my grandparents just assumed I would leave school at 15 like all the other girls around us in the suburb were doing. Mum and dad were

continually being harangued about the waste of effort and energy and money being put into my education.

What about your brother what had he done?

Phil, my brother, was bright but he was not as academically oriented as I was. And he suffered because I was dux in the school, his sister who was a year behind, and there's poor Phil struggling and is like a normal student. But he did well athletically so that was his area of specialty. He did go on to university but only after he did national service. And then my sister also went to university but again part-time many years later. My mum actually started university in her middle years.

Did she finish?

No she didn't but she did get a diploma so she did do a number of years part-time.

You inspired her did you?

Yes. And I remember at 16 my father had to get extra certificates for his electrical work and I remember sitting around the dining room table doing equations together and I was teaching him. Both my parents were very bright but they just didn't have the opportunity.

Were there any particular teachers that you remember that motivated you, you sound to me as if you were a bit self-motivated?

Well I did actually. I can remember Mr Hanlon who was my maths teacher and basically he would teach the lesson and then I would turn around and teach my girl friends who were sitting beside me. And I remember some of my science teachers also were very good, very motivating at that time.

Where did the school get these teachers from, were they ex-servicemen?

No I think they were mostly young people, I mean these people had come through, they're probably my mum's generation, they were post-war teenagers. And I think at that time a lot of women were in teaching, a lot of very bright women, because there wasn't much else to do. Women didn't have lots of opportunity and so we had a lot of very talented women in particular and also men.

The teachers would have been educated before or during the war?

Many of these teachers would have been educated in the 50s I think so after the war, late 40s early 50s so a lot of them were young. And a lot of them only two-year training, some of them university educated because at that stage, teachers even at high school only had teaching diplomas.

The name of the high school has gone out of my mind.

It's Marsden High School, so it was named after John Marsden because the area I guess was near Parramatta and I guess it was reflecting that.

In your final year at Marsden High School how many of your colleagues went on to university?

A fair proportion of them actually. Marsden had a different area, catchment area, and it had a couple of primary schools that had specialist classes, and most of my friends at school I guess their parents were more professional backgrounds.

You were very interested in science and mathematics, was that a feature of the school or did some of the people from school go on to do arts or medicine or law?

It was just a well-educated school, it didn't have a particular emphasis on maths and science it had a strong focus on academic achievement I think.

I think you've answered my next question, it was about was there resistance to you going to university?

Not from my parents, my parents were surprised but they were very supportive and they said they would support me through that, as long as I got a scholarship that they would help me through.

You did have a commonwealth scholarship?

Yes.

Did your parents support you as well?

Yes but in a very 1960s way, in that they fed me, housed me and they gave me health insurance cover and whatever. My mum would give me her \$35 child endowment to cover my train fare. And then essentially I had to work during summer to provide my clothing and entertainment. But at that time young people didn't spend a lot of money, I didn't have a lot of clothes but no one else did. We didn't go out that much to expensive things and so our needs for money perhaps were more modest.

You started university in 1971 just before the election of the Whitlam government and soon after that the universities became free but you were still part of fee paying and the commonwealth scholarship paid your fees?

For the first two years and then years three and four fees were free, but I still got some money from the scholarship for books and stuff.

And you had vacation jobs in the railways and the TAB, was that because of your mathematical ability?

No my mum worked in the TAB, she was recording the bets, and when I was in Year 11 or 12 she suggested I could get a part-time job there on the weekend. I was a collator, you actually manually had to add the bets between closing the race and then the race being run and you'd

have to send them into a central place in Sydney so they could collate the bets across the state. And so I got very good at manual addition very fast. And then I did that part-time for a while. I actually got into trouble at school because on Melbourne Cup Day I took the day off so I could work in the TAB and the school principal thought this was very inappropriate. And as my mother pointed out that as I was dux of the school she didn't feel it would actually affect my education.

Probably helped.

And the train was fun too, they used to take on university students during the summer break because they ran extra trains and I worked as a train stewardess in the buffet dining car.

Going up and down, interstate?

Mostly within New South Wales, we did occasionally go to Melbourne and I washed [dishes] from Sydney to Melbourne.

You mentioned in your interview with Alice Garner that you were very much involved in the local Presbyterian Church, you said that your father had gone to a Catholic boys' school so was your father a Catholic?

Oh yes it was a mixed marriage. When my father's mother and he went to ask to marry my mum the door was slammed in their face because there was a difference in religion. But mum was pregnant, she was a teenage girl and pregnant, and so they did get married. Dad had 42 first cousins, it was a big Irish Catholic family. And after they married mum refused to have us brought up as Catholics and so basically my father was cut off from his family except his mum and his aunt I think.

Cut off from his -

His relatives because they were Catholic.

So he became part of the local Protestants?

No he didn't, basically he didn't return to his faith until he was 70. So he was just cut off.

Were you part of what was known in those days as the PFA, local Presbyterian youth groups?

I belonged to the fellowship group yes.

It was a community, the church was probably the centre of the local - one of the centres of the community.

Hmmm.

You went off to Sydney University to do a degree in, what did you start off thinking you were going to do?

I entered into a science degree but I went to see the careers adviser at the university, I can't remember if it was at the beginning of uni or end of first year, thinking I should focus on something practical like nutrition or food science. She looked at my scores and said look you just do whatever you like.

So she was a great help!

So she was a great help! She just said to do whatever I liked and study what I wanted to.

In your final year of high school had you done biology or was it physics, chemistry, mathematics?

No at that time in the high school certificate in New South Wales you either did - I mean I did physics and chemistry, you had to do that, and it was either biology or geology so I majored in biology and then I did high level maths and geography.

For your final year?

Yeah, so I only did four subjects for my final year because I did them at such high level they counted double.

Did you not have to do English?

Oh yeah sorry I did English too, I apologise for that. English I forgot about that, that was also compulsory.

Were you good at English?

I was but I actually bombed out in the high school certificate. There were two exams, there was the grammar and there was literature and I did outstandingly good at literature and for some reason or other - the grammar exam was the first one of the whole lot and I did poorly at it.

Did you pass?

Barely. And it was interesting because it went to a committee meeting to decide what to do with me because I was doing level one English and the gap between level one English and failure was really small, and they had to decide whether to fail me. And if I'd failed I would have had to repeat the high school certificate despite doing outstandingly well in the rest of the subjects, but I scraped through.

So you went to university, the careers advisor said do whatever you like and so what did you like?

I liked science and I liked biology in particular, but in first year uni at Sydney you had to do maths, chemistry, physics and something so I did maths, chemistry, physics and biology.

At the University of Sydney when you went in 1971 was there a subject called biology?

There was first year biology.

So it wasn't divided into zoology and botany at that point?

No, and I think actually in first year you had to do everything.

So you did a bit of botany and a bit of zoology in biology?

Yes. And in chemistry it was organic and inorganic, you had to do everything, which I think was good so you got a good grounding, and then in your second year you started to specialise within those subjects.

As a matter of curiosity was genetics at that point in the early 70s was that starting to be part of the courses?

It was quite strong actually.

The double helix, that knowledge had filtered through?

Yes, well genetics was actually quite a strong subject since the beginning of the 20th century because it was from the point of view -

Mendelian.

Mendelian or population genetics, evolutionary biology was quite strong. And in Sydney University it was particularly strong, people like Spinny Smith White and John Sved, who were very eminent geneticists ran the genetics program there. Although Charles Birch ran the biology program; he was [also] very eminent. So the Sydney University was very strong in biology.

But were people excited about the double helix?

I don't remember that no, no I don't remember. I focused on population genetics side. We knew about DNA and the double helix but that was probably more in the biochemistry area, so no I don't recall that.

Your ability at mathematics would have stood you out probably amongst many biology students as having all of that genetic stuff being quite simple to understand?

Yes, although I didn't struggle at maths in first year uni, but clearly I really saw that I wasn't one of the absolute top students in that area.

So you switched to -

So I switched. But having level one maths is really useful.

In second year what did you do?

I did chemistry, biology and something else, I can't remember.

When did biology split up into -

In that year you had to do - well each term, there were three terms at that stage and I focused on zoology. But again we had to do a broad range of zoology, so I did invertebrate zoology and vertebrate zoology and another subject.

And then in third year?

I did genetics as a full course and the other topic was general zoology.

You must have done pretty well because you did an honours degree.

Yes did honours in population genetics.

Who was your supervisor?

My direct supervisor was a Canadian, a guy called Paul Ebert, who's actually gone on to be very well known in the area of DNA bar-coding in Canada. He was a young QE II (Queen Elizabeth) fellow at that stage. And also John Sved, this eminent population geneticist, also oversaw the project.

Can you just tell us, a lawyer and theoretical chemist, population genetics was that a new subject at that point?

It probably was the origin of genetics actually because it comes out of Mendelian genetics, and it looks at genes in populations- because we didn't really have the tools to follow genes in populations at that time it was mostly a theoretical area of study. You were basically trying to understand the relative importance of natural selection, mutation, population size and I can't remember the last one – mutation - as what was the relative importance of those four factors in causing genetic changes in populations. It was mostly as I said theoretical. But there had been some discoveries in the late 60s early 70s around allozymes, around being able to detect variation in proteins that were genetically based that suddenly opened up the whole field and so this area was opening up massively in a practical sense in the early 70s.

Were you looking at populations of insects or plants or what was the population?

At that time I didn't care and so it was more the theory that was of interest. But I looked in my honours year at Daphnia, which are water fleas, and they're pathogenic so the female has young without mating and so we were interested in what impact that has in ephemeral environments for genetic changes.

So they're only her genes?

Basically, but once a year they mate and so you get this massive explosion of certain genotypes and then you get re-assortment, which enables the population to adapt to change.

When somebody says population dynamics to me in 2019 I think of the population of people so was there any relationship, did you see any link between what you were doing and demography?

No.

So there was no -

It was evolutionary biology.

Nothing to do with people?

No. I mean people have population genetics too but no it's not to do with that side of things.

At the end of your honours year you got a good honours, first class honours?

Hmmm.

And you had to work out what you were going to do next.

Exactly yeah.

How did you do that?

I guess again for most honour students you're influenced strongly by your supervisors.

Were there many first class honours graduates in biology at the University of Sydney in that year, and were there many women?

There were four of us in genetics and I was the only female, but there were other women in biology who were doing honours. I don't recall as an undergraduate being overwhelmed by men, as I certainly was in my PhD. As an undergraduate there was quite a lot of women around including women lecturers at the university.

You then had to decide what you were going to do, stay at Sydney or -?

I was interested in research and John Sved was very influential. He said it is not good to stay at the same university to do your PhD, which is absolutely true. I agree with him although that was the norm at that time because people tend to stay in the same city in Australia all their life. And he persuaded us to look around. The ANU had very attractive PhD scholarships, which they supplemented the commonwealth scholarship with, and one of the other students and I in genetics both of us were interviewed by the ANU and offered jobs in population biology.

Offered jobs?

Sorry postgraduate qualifications. They offered us scholarships, if we got an Australian commonwealth one they would give us a supplement and if we didn't get a commonwealth one they'd offer us a full scholarship. So I came down to the ANU in February 1975.

You stayed at University House?

Yes, at that time actually half the PhD students in their first year would stay at University House and so it was a fabulous environment for people my age. And about half the post-graduate students I think - the ANU had a big program of bringing in PhD students from overseas and at that time it was mostly Anglo students from the US, Canada, Europe.

You've partially answered this question, when you went to the ANU you went there because there was an opportunity not to study under a particular supervisor?

No, my supervisor was relatively young, I was his first student, and I didn't really know a lot about the university structure in Australia and who was good and who wasn't.

Who was your supervisor?

Barry Richardson.

And he went on to become a professor.

Yes and he also is now here as an honorary fellow at CSIRO.

So he'd just come to the ANU?

He'd been there a year or two and he was just out of - he'd done a postdoc I think in the US, so he was a new research fellow.

You were his first student, were you his only student for a while?

Probably for a year and then towards the end of my PhD he started to get other students.

And in those days at the ANU did you come to work and start doing research or were there courses, what was the structure of the PhD at the ANU in 1975?

Pretty much what it is now, which is you'd start a research program. I did actually do a brief course in biochemistry but it wasn't compulsory, but mostly it was by research.

The topic of your thesis how was that arrived at?

I was offered a project, the scholarship at the ANU was to work with this person on this project. And it actually aligned with my interests so that was attractive to me.

What was the outcome of your PhD when you look back?

You mean the research?

Yes.

It was quite interesting. It was a very interesting time in evolutionary biology because people were beginning to think about the role of social structure, of how populations organise themselves in to different social hierarchies and how that affected evolution. So there'd been quite a lot of

stuff around about what was influencing evolution. And I looked at animals that were socially organised in strict hierarchies, that would strongly influence their evolution. And I looked at this issue in rabbits in a natural population of rabbits out at Lake Urana and it was quite clear that despite this apparent rigid social structure that it wasn't playing a huge role on who was mating with whom, there was quite a lot of mating outside that structure. And there was quite a lot of movement of animals between the different habitats, which was much more influential. And so that whole idea began to be unpicked not just by me but by others over the next decade, so that was one of the bits of evidence that helped with that.

You did a lot of field work.

Yes I was in the field every week for months.

And the rabbits were somehow or other tagged?

We had ear-tags on them. It was quite unusual for me because I was a city girl. People keep talking about everybody in Australia has relatives who have farms. No one in my family had a farm, I'd never been on a farm, I was a city girl. So this was unusual, I had to learn to drive a four-wheel drive, how to shoot, I had to do fencing and dig holes so that was rather fun.

It would have been pretty hot and dry out at Urana.

Yes, we had to get up very early in the morning before sunrise so we could get the rabbits out of the traps, because they were live traps, before nine o'clock otherwise they would die.

Because of the heat.

Yeah it would be 35 degrees by nine in the morning, so it was hard work.

You published quite a bit of that PhD work?

Yes.

Did you like writing papers, was that an enjoyable part of being a research scientist?

Not particularly. Although I have a very deep passion that if it's not published, we don't know it, and if it's not published properly. One of the despairs I had throughout my professional life in CSIRO because I worked in more applied areas, was to see the influence of the grey literature and how it would distort our knowledge base because people put half-baked ideas out, that had not been analysed properly. So things were supposedly known that actually when you looked at the data carefully it wasn't correct, so that was a frustration.

Can you just go a bit more into this notion of the grey literature in population dynamics, where was the grey literature?

It was the grey literature in general in science I don't think it's just population dynamics.

Give me an example of grey literature.

I'm just trying to think of a good one off the top of my head.

I don't think there's much of a grey literature in chemistry.

In agriculture there's a huge grey literature and so a lot of research is done on pest species, because I switched to entomology when I came back and worked in CSIRO. And so there's a lot of research done on insect pest species, how to manage them, trials of insecticides and management and stuff. And a lot of that's just very routine and people just do experiments and they might publish it in a conference proceedings or in a magazine or whatever.

In a trade magazine?

Yes, but it's a bit more than a trade magazine but it's not a serious -

It's not refereed?

It's not refereed in the detailed scientific way. And so a lot of that [science information] becomes truisms; people just accept it to be the truth. And when you go through and actually look at it properly you realise it's wrong. A good example, not done by me but by colleagues, was that friends of mine wanted to use some spare cash they had in some grants to go and explore one of these pest species and look at its presence in the ephemeral environments in the desert. And the cotton industry said oh no that's a waste, it's what goes on in the cotton industry is all that matters. And so fortunately these guys said bugger it we'll go off and do it and so they did, the four of them did this trip to the inland and had a great breakthrough and understanding as to why one species was resistant to insecticides and the other one wasn't. And it was to do with this population dynamic between the habitat and the desert and the habitat in the cotton. And so it was an example where something had become entrenched in people's thinking, it had never been challenged properly scientifically. And it was only when people did it properly and worked it through, did they actually work out the truth.

When you talk about grey literature you'd be familiar with the CSIRO publication Rural Research?

Yep.

Was that the grey literature.

It's an example of the grey literature. So the grey literature would be things like magazines, popular magazines; conference proceedings are a particular form of grey literature.

Do you think the stories in Rural Research were questionable scientifically?

No, I think it's more about if they're reflecting good science that's been done properly and published properly than they are a really valuable and useful way of communicating that to a broader audience. The problem was for the people doing the work, the science, they would quite often put their energy into writing articles like that or conference proceedings or reports to

granting bodies and not put the effort into writing up the work properly in a structured way for a scientific paper. And so then they were not actually investigating their thinking through to a logical conclusion. And so that's when you started to get ideas spreading that actually were not really well supported by evidence.

So there's been an ongoing long-term debate in CSIRO about the importance of publications particularly for promotion?

Oh yeah.

Am I hearing you correctly say that you think they are very important?

Absolutely. And I think I've seen a bit of a correction in that trend in CSIRO, I think there is more recently an acknowledgement of the value of publications as a means of really testing out ideas. I think what we're seeing is more maturity that says that's not the only thing, and that for some people that's not the thing that should get them promotions. But the core of our science has to be quality, scientific peer reviewed publications because that is the only time that you actually get to think through in a clear objective way or as objective as possible, rigorous way, what you're putting up. So yes I'm a great fan of publications but good publications not just publication for its own sake.

This is a bit of a diversion from our script but you've raised some very interesting points here particularly to me about the role of the end user in deciding research programs in an organisation like CSIRO. So you said that the cotton people who are presumably providing a lot of funds for the research for the division of entomology or whoever your friends worked for said that they weren't interested in this ephemeral project but the scientists went ahead and did it anyway. So how do you see the interaction between the demands of the customer and the thoughts of the scientists, how did that work out? I mean there's a top down bottom up approach.

My funding was by the cotton industry, my own research funding, and so I was quite experienced in knowing how to deal in that environment. By and large I think that end user was very good and open and flexible and so I think they would have known that these people would have gone off and done the work. So I think there is a dialogue that has to go on.

And when they found the results did they say thank you very much, so it turned out to be all right?

Yes. And I think also part of that research to the inland was funded internally, and some of the people on that trip - there were two university people and two CSIRO people I think. I think yes we have to manage that balance very carefully. So I think it's okay there's some research that can be funded and driven by the end user but the more they drive it the more they define it I think the more they have to pay for it. And so you get this co-investment model which goes from zero to 100%. And I think if you want to do contract research you pay in full for it. If we want to go and do something and pursue some angle just for our own sake then we as CSIRO should pay for it. So co-investment is always that challenging area of how much should each party influence. And I think it has to be a dialogue. And cotton actually overall was a very good funder, as is grains,

because they give a lot of leeway to the researchers to decide how to do things and what the detail is.

And there's a trust that builds up between the two groups isn't there?

Yes. And CSIRO had very good trust both with cotton and with wheat. And I think some of the other industries, I think initially we struggled to establish that trust with horticulture and I think we struggled at times with meat. Relationships with horticulture are very good now. But that partly reflects the industry's maturity around this. Grains and cotton were much more strategically driven, they could see that investing in strategic research was what they had to do in addition to funding very on the ground here and now research. And so the maturity of the industry is critical here in determining how that dialogue goes on.

Getting back to your PhD in the population dynamics of rabbits and you say you finish up your PhD, you publish some stuff and then you have to decide what to do next. And you worked in the Woden Valley Hospital for a while, was that filling in time?

Yes. Well I was unemployed and so I went on unemployment benefits and at that point when I originally got the job I didn't have the Fulbright.

You finished your PhD and hadn't fixed up a postdoc at that point?

No at that point.

Was that unusual?

It was becoming more common because 10 years before the university system had exploded, there was massive opportunity, but then it stopped because it had filled all these positions with young academics and there were no [new] jobs in a sense. Also I think my supervisor at that time was inexperienced and didn't have the networks, and so yes it took a little time to get an opportunity. So I went on unemployment benefits and part of that condition was I take a job if it was offered, and this job came up at the hospital.

What was the job at the hospital?

It was quite funny, it was in the laboratory doing radio-immuno assays, which had just come in, looking at hormone levels, and so I did those for six months I think.

Did you have a partner at that point?

Yes, in fact I met my husband, who's now my husband, in the first 10 days I started my PhD but we hadn't been going out. But at that time Michael and I were living together so yeah.

Was he a PhD student?

In the same department, well it was even worse than that. He's a statistician, he wrote the statistical program that helped analyse my PhD. And so we actually started living in share houses

about a year after we both met. So yes we've been together on and off really for quite a long time, and worked quite closely together at that time.

Did he ever work for CSIRO?

No, he's actually in private practice.

So you worked at the Woden Valley Hospital and a Fulbright postdoctoral fellowship came up, how did that occur?

It partly came out of support from the department I was in at RSBS, that was one of the options we were pursuing. I had applied for other jobs unsuccessfully. So this Fulbright scholarship came up, I was interviewed, I was shortlisted and then became successful. Sorry before that, the reason I went to Berkeley was I had a boyfriend, before Michael my husband, who was American and he went back to San Francisco.

So he was at the ANU and Michael was at the ANU?

He was at the ANU in my first year. So Michael and I were just friends for a long time and then it was later on we hooked up. My first boyfriend during my PhD was American and he at the end of the year went back to the US because he'd finished.

To Berkeley?

Well to San Francisco where he worked. And so I thought when I finish my PhD I'll go to Berkeley. I originally went there for a visit during my PhD and met up with the person I later did my postdoc with, and so I actively pursued the Fulbright in order to get the postdoc. Well of course by the time I went to Berkeley I'd broken up with the American boyfriend but I was there so it didn't matter.

You went to work with a particular supervisor and who was that?

That was Professor James Paton. Jim was a very good evolutionary biologist working on small mammals.

Were you still doing population dynamics?

Yes, I'm an evolutionary biologist with an emphasis on field populations and so I did field work with small mammals called pocket gophers.

Gophers?

Yeah little gophers.

Was that in the wild?

Yes it was, well we had a natural history reservation and they were wild populations and so I was trapping them, looking at whether their particular lifestyle influenced their evolutionary biology and again were able to show that wasn't necessarily true.

Your whole experience of postdoctoral fellow is very well covered in the Garner interview but for the purpose of continuity and completion could you just briefly summarise to us how important that experience in the US was to your subsequent career?

It was actually crucial to me because the ANU was a very good school, very good university but there was always this thing about big American universities and so for me to go to Berkeley and to find that I could hold my own and that I realised that the education I had at the ANU was very good was actually quite critical to me in terms of my thinking when I came back to Australia about how I viewed quality education.

What year did you go to Berkeley?

1980, September 1980 I started, and I came back in December 1982.

So it was nearly three years there.

Two and a quarter years, so it was a two-year post doctorate basically. Also it gave me a lot of confidence about my capacity to do research. At the end of my PhD I thought oh my God, am I very good? Can I do this because you're usually pretty shattered coming out of a PhD. And so it was very important for me to build that confidence in myself as a young researcher and to know that what I had was good, I could do good research.

Spending two years in American society albeit a very peculiar part of American society in the San Francisco area, what was your impression of the difference between living there in that society and then moving back?

It was quite interesting because we watched a lot of American television at that time and all the films were American and so we kind of thought that we were like the US but we weren't. And I was quite shocked by the extent of the differences culturally between myself and my American colleagues around everything, medical care, politics, the whole thing.

Religion?

Very much so. The group of people I was with weren't particularly religious but it was quite clear there was this very deep and broad conservative religious paradigm in the US, which was quite different. You had this extremely liberal top sitting on top of an extremely conservative bottom. Some of the things were just weird.

Nixon was the president.

No Reagan, I remember sitting on the train [in Berkeley] and actually they announced the election result before the polls had closed in California, it was quite staggering. For me that was a shock

too that they would do that. But just things like when I came back to Australia when I was at Sydney airport going down the escalator coming up the escalator was two young women, I guess they were late teens early 20s, and I looked at these young women and I thought I'm back in Australia. Because these young women had flowing hair, they had a very small dress on with no bra underneath and they were completely natural. And I realised that that's what Australian women were like; no great make-up, no tizzy hair, just this relaxed natural look about themselves. And I thought that's different. I'm used to American women being very formal and well dressed and lots of make-up and lots of hair-dos and things. So just that cultural difference about what women were like was quite stark to me.

Getting back to your publication, you had a lot of papers up to 1981, which presumably were your honours and PhD, and then a break so the postdoc papers came a bit later.

Yes a year or two later, they just take a while to publish.

But you published a lot of papers with JL Paton.

Yeah Jim was my supervisor. I guess I decided to go for big papers rather than many more short papers.

Anybody listening to this who wants to know more about Joanne's Fulbright experience listen to Alice Garner interview. So you came back to Australia in 1983 without a job.

Yes, sorry it was the end of '82.

Where were you living, you didn't go back to Ermington?

No, my parents had moved from there anyway. There was no way I was going to go home, I was 29. My boyfriend and I had separated for those two years because we weren't in a long-term committed relationship but we would write to each other, Michael would write me these 10-page letters in tiny print every week of the two years just what he was doing, what he was up to and I'd write back. And so we decided towards the end of my postdoc we would travel around Europe together for three months, so we met up and travelled around Europe. And I think then we decided that I would come back to Canberra where I could at least work as an honorary fellow in places while I looked for work. We did that and we moved to Canberra and then immediately Michael got a job in Sydney so that didn't work out too well. So yes I came back here because I could be an honorary fellow, I had an office -

At the ANU?

No actually at CSIRO.

How could you be an honorary fellow?

Because I had connections through my rabbit work and so CSIRO offered me -

With entomology or with wildlife?

With wildlife out at Gungahlin, and they offered me a desk that I could come in and work. And also ANU actually did give me some part-time work helping to clean grasshopper cages and so I did that.

Did that give you an opportunity to write up some of the stuff from Fulbright postdoc?

Yes so that was quite good, and it also kept me in the system I think, kept me connected to people. And about six months into that experience a good friend of mine who worked on Heliothis, well who worked on this particular moth I came to work on - there was a big outbreak of resistance in the cotton industry, insecticide resistance, and Peter could see that - Peter worked in Armidale and he could see though that my skill set was -

Peter was?

Peter Gregg, he was later professor at the University of New England. Peter was a young lecturer there at that time, he'd done his PhD with us in Canberra so he knew me quite well at that time. And he knew that there were some questions that needed to be asked that my skill set could address.

Had you done any work on insects before that?

I had actually, after I finished my PhD the ANU - I got a short-term three-month research assistant job working with Dave Shaw on grasshoppers and again doing some allozyme work for him, which I published with him. In a sense it didn't matter what - what population it is, it doesn't matter.

You don't care what -

It doesn't matter because when you squash them up in a test-tube it's all the same. So Peter approached Max Whitten, who was the chief of entomology to say look Joanne should come and do this little project, can you fund it? And Max said oh yeah we will. And so I got a two-month position with [CSIRO] Ento doing some population genetics work. And of course you couldn't do it in two months so I was extended month by month for about six months, and then the job came up that I applied for and didn't get initially.

Had you had much to do with CSIRO before that?

No.

When you were at ANU was there any interaction between that department and CSIRO?

No not our department, I think other people in the building RSBS, the people in plant sciences had a lot - we were deeply embedded with plant sciences at CSIRO but not my area. I was more connected to CSIRO wildlife because I was working on one of their old sites and CSIRO had done most of the work.

The rabbit work?

Yes.

Was a CSIRO old site?

Yes and there'd been a lot of population ecology done on that site before we went there, that's why Barry Richardson chose to use that site.

What were your early impressions of when you went into this building that we're in I suppose?

I don't know, it was just an old building.

What was your impression of CSIRO and the sort of scientific culture of CSIRO compared to your experiences at ANU and then at Berkeley?

They're actually quite good. I had a small group of people I interacted with in this project and they were just as good as other people I'd worked with, just as scientifically rigorous. There were some quirky things going on in the building. I mean there was a couple of people who used to come into work and sit down, put their feet on the desk and read the newspaper waiting to retire. I think one of the other things I noted in those early couple of years was there was a number - it must have been a generation turnover going on because I'd go to a number of afternoon teas, there'd be three people retiring and their combined service would be over 100 years. And that staggered me as I hadn't seen that before. But that was just because different - I don't think it was unique to CSIRO.

Well the division of entomology was one of the first divisions that was formed in 1929, '28 or something like that, at the start of CSIR and the division of economic entomology it was called, so there may well have been people who'd been there since before the war.

Another comment that we've received is the difference in philosophy if you like between CSIRO employment and employment in a university, which in a university is a series of short-term contracts whereas in CSIRO back in those days at least it was a job for life if you wanted it.

You're joking, my first contract was two months, my next contract was one month, one month, one month, one month. Then I got a three-year job and then I got made indefinite.

Permanent.

At Universities 10 years before you walked into a permanent job, so I think it's a timing issue. So the universities had filled up in the 70s with expansion and expansion of the 60s and then suddenly the only job opportunities were term ones. And CSIRO was a bit the same but probably just a touch later. By the time I came in this division, entomology, was very successful at external earnings much before anybody else and so short-term contract work became the norm. And so that's how most young people came in to entomology was on a contract, and mine was particularly short but that was just an unusual thing; it was made up, it was created.

We'll possibly get to this but a big factor for young people particularly if they start thinking about having a family is continuity of employment and being able to buy a house and do all the things you need when you've got children. Was any of that in your mind around this time?

No.

You just needed money to survive.

I needed a job, at that point I needed a job yes.

Just for the record, Joanne came back to CSIRO and was employed as an experimental officer.

Yes that's right.

From August 1983 on various short-term positions until March 1984 so she was an experimental officer on two-month positions.

Because they couldn't put me into an RS position I think at that time.

*And then in 1984 she was a successful applicant for a research scientist position to undertake studies on the ecological genetics of pesticide resistance in *Heliothis*. That was not a permanent position, that was a three-year contract that ended 27th February 1987. The salaries and everything came from the Cotton Research Council and the money continued until June 1987 but Joanne's position ended in February 1987.*

When I was on maternity leave.

And Max Whitten wrote a very strong letter to Joe Lansburg who was the acting director at the time saying that despite all of the rules that might have been applying they wanted Joanne to be given an indefinite appointment because they said if she applied for any job that was going she'd get it even though she hadn't applied for it. And the acting director gave Joanne an indefinite appointment. So you took quite a while as a contract employee of CSIRO before you were given an indefinite position.

That was the norm in the division, that was normal in entomology.

They tried you out.

And also at that time we started to only fund people for the length of money we had, and so that was the beginning of the problems around contracts.

There was a lot of union unrest around that.

Yes and I think every enterprise agreement we went through over the next two decades actually renegotiated that balance between contract and indefinites. And that was also of interest to me. But it was interesting, I was on maternity leave actually when I got phoned up by HR, I thought I'd

be finishing any week and she rang me up and said oh no you've been made indefinite and I thought oh that's nice.

Joanne, I think that this is probably a convenient time for us to have a bit of a break, it's not quite an hour. So we're back from our break now and let's just go back to one thing we were talking about before Joanne. We were talking about the influence of the grey literature on agriculture and you were saying that sometimes it has some deleterious effects but could you just expand a little bit on the role of grey literature, what is the proper role of grey literature in helping innovation in Australian agriculture.

The grey literature is a very effective communications tool that bridges the gap between the scientific areas and its application to real life and puts it into language that is understandable and takes into account a broader range of issues around social dimension and so on. It's not a substitute for the scientific literature, which has a role in terms of rigorous study and analysis. And my concern around the role of the grey literature is that people were so busy they would focus their attention on putting their original research only in the grey literature and not actually into proper scientifically rigorous journals. And it was because people were being drawn into that just because of the need to do it and neglecting I think the proper role of the scientific literature.

So the grey literature is very useful if it's actually quoting peer review research rather than as a substitute for peer review research.

Yes exactly.

Thank you very much for clarifying that. We were talking earlier about you start off at CSIRO and you start as an experimental officer working on population dynamics and control of Heliothis, which was a major cotton pest. It seems to me that you kept working on that for much of your career, what were your main achievements in that whole area of Heliothis?

There were a number of achievements and very early on in that initial work I was able to show that the population genetics of - there were two pest species in cotton that were closely related and they were almost indistinguishable to the naked eye. People knew by the time I came in to the area there were two species but they weren't able to readily distinguish them in the field certainly at the small larvae and egg stage. And so I assisted to do some of that work to actually help people, give them tools to be able to distinguish between them.

And then I also was able to lay the foundations to understanding their population biology had to be quite different because their genetic structure was quite different. And that itself led to the tendency for one of the species to become resistant to most pesticides whereas the other species never did. And that was quite fundamentally important to the cotton industry. So they needed to know which species they had in their crop at a particular time, whether it was resistant or not.

Did you work out why one became resistant, was there a genetic basis for that?

It was to do with their population biology, it's really to do with a balance between natural selection and immigration. And so as genes for resistance increase in the population they can get

diluted out by new immigrants coming in from areas where there's no selection operating. And that's what was occurring in the species that had a big build up of populations in the desert, each year they would build up in winter and then migrate into the cotton growing areas in spring diluting out any species of the population was left there from the previous year.

Whereas in the other species they didn't actually have this big population out in ephemeral habitats, they were focused in the agricultural areas and therefore they were always being exposed to insecticide and so the population could build up, the genes would actually build up over time due to natural selection. So it was a balance between natural selection and immigration effectively was the difference between these two species.

How did that affect farming practice?

There was a big resistance management strategy that I and others played a key role in designing and implementing in the cotton industry that changed the way I think the industry managed its use of insecticides and what type of insecticides it used and when. And this knowledge actually helped to shape that strategy very much.

Did you work with insecticide crop protection chemical companies?

I had interactions with them, a number of the companies, so I certainly was quite relaxed about that. They were very interested and involved in the work and so I didn't have this view that they were the enemy, they certainly were part of the system that we needed to work with.

Can you tell us a bit about how projects were selected in the division of entomology when you came, just explain to us how you worked on the Heliothis resistance problems, why did the division do that and what was the project selection and who supervised the direction of the project?

It was quite different then than it is now I think in CSIRO. But certainly that project was designed by the two chiefs, one of entomology and one of plant industry working together, they designed the project and put it to the cotton industry this is what needed to be done.

That was Jim Peacock -

Jim Peacock and Max Whitten, and then this project was created to fund early career research scientists to do this piece of work for three years. My initial [six month's project] work was actually funded by Max Whitten out of money the division had. [In my three year project] I was left alone essentially, although I had supervisors they were very distant and I was given a lot of freedom as a young scientist, and really effectively I was only a - it was almost like a second postdoc, those very junior scientists in CSIRO you're a bit like a postdoc. But I essentially was left alone to get on with it and do what I thought best. And later projects were the same thing, I got to design them.

Were there people from the industry involved in it, I mean you do field work presumably up in the cotton growing areas was that arranged by the industry or arranged by you, how did you get access to the -

CSIRO had a research station in Narrabri and that's where most of CSIRO's interactions were with the cotton industry. And colleagues of mine like Gary Fitt and other people like Greg Constable, very senior eminent researchers in the area were based there at Narrabri and I interacted with them. But in the first few years my field work was actually done at Emerald in Queensland, Central Queensland, and again I just got contacts through the industry through the other research bodies.

The industry was fabulous in that it really pulled together the whole system around cotton. Researchers had annual meetings, we had workshops that they all supported and so they kept us all connected and that way I could reach out into the state departments, into universities and to other researchers and into industry to get help. So it was actually quite a good ecosystem for a young researcher.

How did they interact time wise with the development of Roundup resistant crops so that you could use insecticides?

Roundup was a separate issue, it was to do with weeds and I was working on insects. So I guess *Roundup* was being used, resistance developed a bit later I think. It certainly was around but we weren't focused on *Roundup* resistance.

So you weren't involved in the introduction of genes the Bt?

I was actually because I switched from working on insecticide resistance, in the mid-90s or early 90s, I switched to working on the possibility of insects becoming resistant to Bt cotton and so most of the second part of my career was focused on transgenic plants and how *Heliothis* insect could develop resistance to it and how you might manage those crops to prevent that. But I wasn't involved in the side around weeds. The theory broadly is the same around how weeds develop resistance versus insects because it's evolutionary biology but I wasn't involved in that side of it.

This Heliothis insect is that indigenous to Australia?

Interesting question; there's five species in the genus in Australia or at least there were when I was working on it. The species that became resistant is called *armigera*, and is a cosmopolitan species, it's an old world species; it's found through Australia, Asia, Africa and into Europe. And the American equivalent is *Heliothis zea*, which is a very close relative. We're not sure about whether *Heliothis armigera* is endemic or not. But the other species, *punctigera*, certainly was. But it doesn't matter, it's been around a long time.

I was just thinking the species that was in the desert obviously was an indigenous species, I was just thinking in my mind was the one that wasn't, was that an imported?

No we don't think so but it certainly was much better adapted to cultivating cropping. It might have been a relatively uncommon species before agriculture and then it was able to exploit the agricultural environment much better than the other species. And it might be like possums, if you look at native animals some native animals have exploited the urban habitat much better than others. So I think that's probably what we're dealing with here.

When you grow cotton in the US do you have a similar problem with Heliothis?

Yes, Heliothis is actually the genus, armigera and zea are species in the genus; they're what we call recidivists they're probably one of the top five insect pest species in agriculture in the world. And so there was a lot of focus on them.

You were saying to us before our break that you got the phone call from the chief while you were on maternity leave saying that they'd decided to give you an indefinite position. And you had two children while you were working for CSIRO in the 80s. Many women find child rearing disruptive to their research careers but you didn't seem to.

No I did.

Can you tell us about your experience and what support you had and could CSIRO have done more for you?

CSIRO actually turned out for me was a very good place to have children. The thing that disrupted me more was not so much having kids but it was really the delay in me having my second child. I took two years really, I had a miscarriage and then it took a while to fall pregnant again. And that was very disruptive because I wouldn't plan ahead, I kept saying I can't go to that conference or I can't do that or I don't want to do molecular biology and expose myself. [to harmful chemicals]

When did you have your first child?

In December '86.

And your second one?

In September 1990. It was a personal disruption the fact that I wasn't willing to plan ahead because I thought I would be on maternity leave that was very disruptive.

How long did you have for maternity leave?

In the first one with Katherine I took off four and a half months but I wrote a paper while I was on leave. But then I came back and I cheated on my hours, I worked from home. I breastfed my children for a very long period of time and I refused to express milk so I had to do it personally. I could see that I was working part-time for a few months when I came back. And so with my second daughter I decided that I would actually take seven and a half months off full-time and then I'd come back part-time for six months and then I'd return full-time.

I realised that women often put pressure on themselves to come back to work very quickly whereas in fact you can cope quite well just taking a bit more time off and being realistic about it. So my advice to young women who fell pregnant when I was a manager was to say to them think about it, it's okay to take time off and come back. It's a short period of time really in the scheme of things, you're better off to take time to do what you want to do and then come back.

In fact the period of the birth of your first child was one of your more productive periods of research in writing papers.

Exactly. That was a very conscious decision on my part, if you can't put a lot of effort into doing field work and actually doing new work make sure you get out what you're doing so visibly people see you being very successful and being very productive. And I also had a bit more time to sit back and think about it. And so I was actually quite productive through my pregnancies, I didn't go gaga or silly, and I took that opportunity to write and push stuff out. So yes it was a very conscious effort on my part to be visible.

And after your second child there was a period of 18 months or so when there was no papers, was that a deliberate choice?

No I think I was just a bit overwhelmed.

You had the two children.

Had two children yes. In fact it was interesting because after I had the second daughter I got clucky within months of having her and I thought I'd like another one, and then I made a very conscious decision I could either have a third child and not be so career oriented or I could be career oriented and keep it at two. And I actually then made the choice to just have two children at that point, it was a very conscious effort. I know other women go on to have five children and have a great career but I wasn't one of them.

Comparing yourself to other women it sounded as though you didn't fall prey to depression or lack of motivation, which can be a very serious interruption for a career.

I had a little bit of depression after my first just for a few months but I came out of that. One of the reasons I think is I had a wonderfully supportive husband. Michael had been working in Sydney five days a week for three years before I fell pregnant and the pregnancy was unplanned but we did want kids so that was okay. And he decided he'd have to move his business to Canberra, we had to be together, wherever we were we had to be together. And he then spent the next 30 years of his life being a tremendous support to me. He worked from home in the first six months after I had a baby and then he always worked very locally, he was always available to pick up the children or drop them off and he was very involved in them. And so having a very supportive husband was important.

Also when he moved his business to the house he employed somebody who'd also just had a baby, her baby was seven months old and it was her second. And so I was there in the house with these people who were very supportive, and so for me that make a huge difference.

And Canberra is a wonderful place to have kids because it's so close to childcare and to work, and I lived close by. I could leave home, drop one at childcare, one at school and be in the office in 20 minutes, and so that makes a huge difference. And I've had friends in other cities who've spent an hour and a half each way each day in the car, it's very hard to have children under those circumstances.

In the group of research scientists at the division of entomology when you joined were there many other women?

No, I was probably one of the few RSs, this is when I became an RS. In fact we had a newsletter that came out and in the first week it said we'd like to welcome Miss Joanne Daly to this position. And I said to Max that's not good enough Max. So the next week it comes out we'd like to welcome Ms Joanne Daly to the position. And I said Max come on. And so the following week I get welcomed again, we'd like to welcome Dr Joanne Daly to the - so it took people a while around the division to work out I was a doctor, I had a PhD. And so there were a lot of women in the division but as technicians and so I was unusual. But Max was very supportive of women, he recruited a number of young women into research scientist positions at that time.

Did he ever explain to you why he preferentially appointed women?

No I think he just was very supportive. And I don't know if he preferentially recruited us I think there were just women coming onto the job market and I think he was just very open about the possibility of recruiting women. He also recruited a lot of young men too. We just suddenly had this upswing, women were acceptable to recruit and he wasn't prejudiced about women having children or being married or any of that silly stuff.

Before we get on to your career as a manager in CSIRO I'd just like to have a brief discussion about your involvement in professional societies and academies because as we said earlier you and I have interacted quite a bit in the Academy of Technological Science and Engineering. You were involved in professional societies and academies, was that encouraged by CSIRO or what effect has all that had on your career?

I always felt very supported to do that. I think there was a sense of citizenship, scientific citizenship, that I always felt in the division and that there was an expectation that you would participate more broadly, you'd referee publications, you'd look at grants, you would support bodies to run conferences and things. So yes I felt strongly supported to participate more broadly in the scientific community.

When you were the chief did you support your young scientists to do the same?

Oh yeah. One of the things that Max gave me was an opportunity to participate actually in doing some quite senior things as quite a junior person. And so I once sat on a selection panel very early in my career for the new EEO officer at CSIRO, which was a corporate position. Everybody else around the table were chiefs or institute directors and there was me. And I think that exposure very early on also in those broader citizenship things in CSIRO was very influential on opening up my eyes to work beyond just being a bench scientist.

We're now going to talk a bit more now about your role as a manager in the organisation because you spent quite a bit of time as a manager. My reading of your PH file says that you got promoted to principal research scientist and soon after that became a manager, so can you tell us what you think of what was your first management role in the organisation and why did you take that role,

how were you selected, did anyone give you any training for the role, did you have any instructions?

My first management role was as program leader back in 1994 I think, and it came out of Paul Wellings and I were quite close colleagues, he was in the division at that time and he was a program leader. And the division was going through a bit of turmoil around -

Who was the chief though?

It was changing, it had been Max until '91/92 and then there was a falling out that had occurred at that time.

A falling out?

With the board.

With Max and the board?

Max and the board, and Max had been very politically involved highlighting lack of funding to CSIRO. And Max had not been renewed in his contract, which was quite controversial at the time. And Paul was successful at getting the job as chief. But before that Paul and I were heavily involved in thinking about restructurings in the divisions, he and I -

Why were you -

We just were interested.

Informally?

Yeah informally, because he was a program leader I think, he'd just become a young program leader and we'd had coffee together and we were just interested I think in management issues and how organisations run themselves. So he and I had spent quite a lot of time behind the scenes thinking about how the division might restructure its programs and whatever. I think Max was still chief.

Can I just go back briefly, before this time did the division have programs or when you were doing the Heliopsis work were you part of a program.

Yes I was.

Or were you independent?

No everybody was part of a program but there was very loose control, very little control within that, you were an independent scientist within this program.

So your program leader at that time didn't have much influence in what you were doing?

No. So I think the division was thinking of changing its program structure to reflect -

When you say the division.

Entomology.

Yes I know but -

Well the divisional manager, Max.

So that was Max?

Max Whitten yeah. And Paul was interested and so he and I would chat about different structures and how it might be organised. And when the organisation went through there was this position vacant broadly in my area, my program leader who would have been the natural person he was retiring.

Who was that?

Brian Fletcher. And Max wanted me, and I said no I'd just come back from [maternity leave]-

So Max was still the chief?

Yes at that time. And so I was thinking about - I mean I was trying to re-establish myself scientifically in research after having maternity leave and young kids and so I wanted to really focus on that for a few years. But Max said no I want you in this role. And I said to him I'm not ready and he said you're never ready. He said the advantage of being a program leader is you get to influence a broader range of science than you ever could as a research scientist. And so I was persuaded to take on the role.

It was interesting, the program wasn't that big; it was 50 people but I had some very senior people in my program, men who were chief research scientists, they were level eight or nine and I was a level seven. And they pointed out to me very clearly that how could I do their performance reviews when I was not only a woman I was more junior than they. So I told them well I'm your program leader and I'm doing it. I found it very stressful for the first year, I was totally unprepared. But CSIRO at that time in the 90s started to put very serious money into management training, fortunately. And I was very lucky to go to a course for program leaders and it was like the scales fell off my eyes.

Was that with Bob and Jane?

Yeah and Maxine Fern, it was the Little Bay course actually, and I suddenly realised -

The Little Bay course what was that?

I was on program leader.

Where's Little Bay?

It was in Sydney, it was a management training school there and they ran the course.

Was that the University of NSW?

I think it became that, I'm not sure if it was at the time. So I did some management training and that was very helpful to me because it helped me to think about the human aspects of the job rather than - I could never understand why people were so difficult at times and it became obvious thinking about -

So you became a manager and then had the training?

Yes but within 12 months. I realised I was very stressed when I went to this training. We were also renovating our house in a big way, which didn't help. So within 12 months I did the management training, and so very much was up for any training that was on offer after that.

So your children weren't very old at that point.

No that was the problem. The younger one was challenging, she was quite strong minded and was difficult, yes so it was tough.

Max and the HR person in the division were they helpful to you in helping you develop as a program manager.

Not really, I think by that stage there'd been the turnover of chief and Paul had come in as the chief in '94 I think.

Maxine was here in this building?

Yes.

Did you rely on her apart from courses?

Yes, I started to develop very good interaction with the HR manager and also with Maxine and others.

Maxime I think it is.

Maxime, and so yes I did have - I sought help, I talked to people and worked through things yep.

Can you just give us an example or two of the human factors in management that you learnt about and started to apply usefully?

One of them was to understand that different people think about problems differently; some people are very detailed people, some people are big picture people, some people like to have the detail first and then they'll come to a conclusion. I like to start with a conclusion and work through

to the detail. But I didn't realise that. And so I would send out a newsletter, this is when email had first come in and I was - and all my program was all around the country and so I would send out a little email newsletter asking for information or requests. And I'd get this abusive email back from the same person every time, and I had no idea why he was doing this. Then I realised that he was a detail person and I'm a big picture person.

And so what I did was I would actually send a draft to him first, get him to sort out what he needed from this newsletter and bring it back and then I'd send it out to the group. That was a really big insight for me to realise that people actually look at the world very differently. I kind of knew that intuitively but it's really about even the way things are set out, so that was one.

The other came from a later management training, which was a friend of mine said to me he'd finally worked out what to do when someone comes into your office and screams at you and they're really angry. He said I now know what to do, he said 'nothing'. He said you don't do anything you just stop and you just let it go by. And then you say to them oh I can see you're angry. And so I think again that was realising that it wasn't personal, when someone comes in and they're angry it's about them, what's going on for them. And my role is to actually step out and make sure that I don't take on their anger and their emotion.

Did you get taught about Theory X and Theory Y about how to manage people?

Much later on, I was one of the privileged people to do the leadership development program in the late '90s. And that was a huge investment by CSIRO and I was extremely grateful, that had a major impact on my whole life not just professionally but also personally, and that was almost a two year course, very intensive leadership training. And that's where we did a lot of the conceptual stuff, and that was with Bob Marshall and Jane Lowther. So that had a strong influence on me, I was a program leader still but it had a huge influence on my later roles in more senior roles.

My understanding from your PH file is that you got the position of program manager some time in 1994, that was for 12 months and then you got another - kept going and by - well Max was still the chief in 1995 but presumably by the next time Max had gone and Paul Wellings was the thing. Because in October 1995 John Radcliffe as the director of the institute wrote to Paul Wellings as the chief, so the transition must have occurred at the time. You were the program leader for the pest management program, can you just describe the breadth of the pest management program, you were part of Heliopsis but presumably there were other pests that the division was managing.

So entomology worked on mostly insect pests and their management and so my program covered the broad range of projects that we did on mostly field management of pests, insect pests. There was a weed management group that was separate and there was a molecular biology group that was looking at underlying techniques of management, but we dealt with the management of real pests in crops and cattle, so it covered both livestock and plants.

Had you had much to do with livestock at that point?

Zero.

Except for rabbits.

So I think the merger that went on, that had gone on in '93 and '94 was to bring together both the livestock and the plant based pests into one program called pest management, before that they'd been separated.

As the program manager did you have some responsibility for interacting with the end users, raising the money. We had the 30% earnings requirement by then so was part of your job -

We were up to 50% anyway.

Because of the interaction with the cotton research -

Everything, we had money from everywhere. Entomology was very successful, we were up at 50% when the rest of the organisation was struggling around 20 or something. We had very effective relationships with industry. But in my program I had very senior staff, and in fact my worry was that the majority of the scientists were due to retire within 10 years, they had the established relationships. And so I didn't actually spend a lot of my own time getting the money in and cultivating that because the people reporting to me were very senior and doing it themselves. I've never really had a significant role raising lots of money in my role as a manager, I've always had very senior people directly reporting to me who actually did that themselves.

Were most of these senior people in the division who reported to you mainly male?

All males. I spent my life working with men basically. It was very common for me to be in a room with just men in CSIRO.

You obviously coped with that very well.

Yes.

Initially it caused you some stress you said.

It wasn't the fact they were men, I think it just initially caused me stress being a manager. Sometimes it's easier to manage men I discovered when I was a chief, there were certain differences.

In the 90s you were talking about John Stocker was chief executive, did that have any impact on you, did you know him?

I met him. It had an impact on the division through his relationship to the chief, Max Whitten, and the falling out that went on, and the kerfuffle around that was to do with Max; and John Stocker's interactions and the relationship of both those people to the board. So that had quite a significant effect on the division and me in management but not directly.

The instructions that you had indicated that you had to maintain your position as a research leader, and while you were the program manager did you continue with your own research program on Heliothis?

Yes, so we did some very significant work in my little research group on understanding the way that caterpillars could develop resistance to BT cotton. And we actually came up with quite an interesting insight that initially other researchers in the industry rejected but turned out to be true, which was that although the cotton appeared to be expressing high levels of Bt protein early in the season the caterpillars under some conditions started to survive. Now it wasn't actually because they were resistant; it was because for some reason or other the Bt protein, this toxic protein, was not effective. We were doing the work in the glasshouse and people said oh it's the glasshouse and we said actually yes it might be in the glasshouse but it's real, it's telling us something. And it later turned out to be true, that under certain conditions although cotton is expressing this Bt gene it's not efficacious, it's either being wrapped up in plant secondary compounds or something. And so yes I was quite active in research with my little group through the 90s.

It says that one of the jobs of the program manager is to be part of the senior management team and participate in decision making in the division with respect to a number of things, resource allocation of the projects, identification of key client contacts, helping get corporate funds and so on. How did the division work and what was your role in this allocating money to resource allocation?

The resource allocation we didn't have a major interventionist role. The division ran losses all through the 90s.

Even though you had large external earnings?

Yes. No matter what we did, we ran a loss of two percent, so there was something systemic in the division that was generating that year on year, and it wasn't really until the late 90s that Jim Cullen was able to get on top of that, it was quite fascinating. But my program was generating a vast excess of profit over its expenditure, so we were actually cross-subsidising the rest of the other parts of the division that were not so successful. So it wasn't that difficult for me because basically I had to let my guys get out there and do their job because they were bringing in lots of grants, lots of money. The problem for me was helping them to manage that because they were so busy running their projects and getting new money in and running staff they weren't publishing.

They weren't publishing?

No, well they weren't publishing enough because they were just on the treadmill and that was the problem and trying to get them off the treadmill was a bit of a challenge.

Did you?

Eventually by some of them retiring and actually writing up in their retirement, but they were all getting close to that stage of retirement.

Were you able to start employing young people to take their place?

No, the division was contracting. So, any new position that came up was absorbed - we had a lot of redundancies through that period and so any newly [vacant] position [was lost]- I mean it was very hard at that time. So one of the things I did as chief later on was make that recruitment happen.

It's a very odd story that you're telling us that the division had huge amounts of external earnings and yet was contracting, that's contrary to common sense.

It is.

Why was that?

We kept running - because we didn't really have a very comprehensive control of the budget and so the division was overspending, it had a systemic issue in it that led to over expenditure of about one or two percent per annum. We spent all the money we had by recruiting people, putting them on doing the work and then we had this pool of people who were floating and not necessarily attached at the beginning of the year to money. And because a lot of the time the money was distributed out to program leaders and some of the program leaders were spending more than they earned, but it was kind of smoke and mirrors.

Was Kevin Smith here at that time?

Yes he was.

Was he in charge of the budget?

He would have been very senior. Yes but I think it was actually as a result of being so successful externally, Tom, that drove a lot of this because on 1st July we did not know where half our money was going to come from that year, coming year, but it always came in. And so we held a proportion of people on staff knowing that we absolutely needed them but the trouble was we sometimes double spent the money, and it was that money at the edge that led to double spending.

The division wasn't terribly well managed from the financial point of view is what you're saying?

It was very well managed but at the edges it wasn't. In fact I think we probably had very robust management it's just it always generated this little bit of over-expenditure at the edges. But also the division was contracting because appropriation was contracting in the agriculture scientists through the 90s, and we were saturated with external funds. It was very hard in the [agriculture] space at that time to go above 50% external revenue because of the way co-investment was structured. And so we were saturated, we couldn't grow because we didn't have the approp to grow on, and so as our appropriation was contracting, so were we.

Max was the chief when you started to become a program manager, Paul Wellings became the chief, and then Jim Cullen became the chief. When Paul was the chief he nominated you in 1997 to go to the leadership development program. You've indicated that was a big part of your memory of your career and that was a big part of it, can you tell us a bit about that, what you learnt from that and why was it such a big part of your career development?

I think probably for the first time in my life I began to think more broadly about people issues. I'm very analytical, I'm an archetypal scientist and so my tendency when presented with any situation is to analyse it, and yet in human interaction that's often not very revealing. Well I guess it's a left brain versus right brain and I'm a very left brain person naturally, and I had to learn about using my right brain where you're integrating information and you're taking on values and judgements and instinct and intuition much more in terms of thinking holistically about issues and people. And that program I think really helped me do that.

There were some pretty trying times in the program. I remember one meeting we had up in Cairns, it was a whole weekend, and it was life changing for the people at that meeting. We had to put up our fears and our hopes and whatever, and people were revealing things about themselves they'd never told anybody about. And I came back from that meeting quite different. At that stage I needed glasses but I was so vain that I refused to get them, I refused to admit I needed them and I thought, bugger it, I need to get glasses.

So having loss of accommodation ? you needed reading glasses.

Yes because my arms weren't long enough anymore. And just things like I wouldn't get the kids a pet because it was too inconvenient, and I came back and said yes the kids can have a cat. And just a whole lot of things, I just let go of a lot of stuff, I just thought it's not relevant I don't need to worry about that stuff, it's not important. And just getting a deeper insight into myself and a deeper insight into people and how they interact and values and whatever.

Was the leadership development program courses or did you have some project that you had to do. In later times the people on the leadership development program spent some time shadowing an executive, was that part of your program?

Yes but I can't remember what the project was. I did then go on secondment for two years that came partly out of that. It helped me transition from being an analytical scientist into a leader and research manager of people but at a very deep level. And the thing that fascinated me is no matter what bit of the course we did the messages all seemed to be consistent, whether you were doing negotiation skills or managing difficult people or whatever it was all about listening was one of the key things. And understanding people's needs, trying to tease out from them what was going on for them rather than worrying about yourself and imposing yourself on them.

If you look at your publication record it was about that time that you stopped publishing things.

Yes.

Was that a decision you made from then on to concentrate on being a manager or was it circumstances?

It was a bit of both. We did actually publish the work later on so there was a bit of publications later on.

Not much.

No but there was a few critical ones. Look, it was basically I decided, it was really when I came back as chief - I was away from research for two years on secondment and I came back as chief and I partly decided that I could no longer give the attention I needed to give to the research to do it credit. I'm one of these people who really needs to focus intensely on something, I can't do it in half an hour here and half an hour there. And to be a good leader and manager I didn't have that time and so I made a choice that I would give up my research activities and give it to somebody else to do and I would let go, and that was fine by me.

Just for the record, Joanne has got a very distinguished publication record and her second most cited paper was in fact published in 2005, a long time presumably after the work had been done.

What was the paper?

The paper was Season-long variation in expression of Cry1Ac gene and efficacy of Bacillus thuringiensis toxin in transgenic cotton against Helicoverpa armigera.

That was the paper I was telling you about.

And that was with KM Olsen.

Yes, Karen was then my senior technical officer and she took over. I got her to write up work because she'd done most of it and she was very experienced. That was the work that I was telling you about with the Bt gene, that it wasn't always efficacious even if it was in high protein concentrations.

And that paper in 2018 was cited 10 times so it's obviously a very influential paper in the field.

Yes.

You talked briefly about your period of secondment and that was the period of secondment to the Department of - which was then called Industry Science and Resources.

In the first year and then we all moved to DEST, Education, Science and Technology.

How did that come about, what did you achieve in that role and how did that help in your future roles at CSIRO?

In the mid-90s -

I think Paul went on -

Yes somebody King, I can't remember his first name.

Warren King.

Warren King had gone before him. So it was either John Stocker or it was - no it was Malcolm McIntosh, when he first came into the organisation he was very keen to see secondments of senior staff into the department and he started up [a secondment initiative with our parent department] - the first secondment was Warren King who went into the same Department of Industry, Science and Resources as a division head. He did that for two years, Paul [Wellings] went in after him in the same role. And then they [the department] were interested in another secondment but this time it was going to be one level down at essentially program leader level, branch head. An email message was sent out to the LDP program people that there's a secondment opportunity and does anybody want it? It took me about a nanosecond to say yes because I just was at that point, I'd been a program leader for six or seven years, the budget cycle had just started and I thought I cannot face this again, I cannot go through another year of doing the same job, I'll do it. And so, I didn't talk to anybody I just said, yes I'll do it.

Not even to Michael?

No, I just responded to the email on the spot, so that's how I ended up doing the secondment. It was agreed that I would do that and off I went for two years.

It was a general invitation and you responded to it?

Yes, I think it was a general invitation to the LDP program so there was 21 of us or something.

What did you do there, was it useful to you?

It was fabulous, I loved it. It was interesting for me, I lived in Canberra since '75 except for two years overseas. I had never really been engaged strongly with the whole process of government and policy and parliament. Canberra to me was a research city it wasn't a government city.

Just going back one step, you were never active politically?

No but I was involved with the Department of Agriculture but at an officer to officer level but never - no I wasn't. And I was never involved in that and none of my friends, all my friends were researchers, so I had no real understanding how the public service worked or what went on.

Or how the political, okay.

Yes, and so I think a lot of people in Canberra are like that and people outside find that hard to believe, I think. I went in to a government department and the day I started was the day that John Howard announced *Backing Australia's Ability*, that big investment in R&D and science in Australia in 2001. That was my first day and my branch actually was doing one of the programs.

Were you the branch -

I was branch head. I headed up the international science and technology branch and my branch had one of the programs that was part of that announcement and so my role was to oversee that, amongst other things.

So you went in as the branch head and day one you had this big job, what did the officers below you think of you coming in?

Some of them were a bit miffed but others were very supportive. In fact, I discovered that people in the public service, particularly in these strategic areas, have exactly the same sort of personality as people in CSIRO, very intellectual thinking analytical people, very committed and I felt right at home. And they were very professional, I mean the public service is an interesting place to work, I don't know if it's still the same; I think it probably is, a well-oiled machinery so they know how to go about -

Who was the secretary of the department?

I can't remember because he was extremely shy [Russell Higgins].

Was John Bell around?

No John Bell wasn't around at that time.

He'd gone by then.

The other interesting thing to me was the chief scientist was Robin Batterham and Robin's office was two doors down. Robin and I we had coffee together [sometimes], and so it was fabulous that I had this very intellectual environment.

What do you think you achieved in that role?

We implemented this program. One of the things I did do was to help people around me, I mean I like to write clearly and simply and I actually helped -

Even though you nearly failed English.

Yeah, that was a bit of a hiccup. So I actually helped people to write briefs that were clear and consistent. In the department at that time, and also when I went over to DEST, you had a lot of freedom and so the expectation is if I needed to write a brief or my branch did, we'd write it and it might go up to the secretary only if it was highly controversial. But basically, you were responsible for making sure your briefs went to the minister and getting them through.

Q: *It wouldn't have gone to the minister without the secretary signing off?*

A: Oh no they would [sometimes].

Q2: *That was common?*

A: Yes, I had to make the judgement as to whether they should get approval from my division head or the secretary; the division head would always see them. The second year was very different, so we had a change in machinery of government and the innovation area was split and I was sent off to the education department, which was quite an interesting change.

Q: *Was that called DEST, Education, Science and Technology?*

A: Yes, and Peter Shergold was the new secretary. He was fabulous. He asked me then to head up the task force to set Australia's research priorities, and that was a fabulous exercise. And I had again a lot of interaction with the minister's office and also prime minister and cabinet [department].

Q: *Who was the minister?*

A: Brendan Nelson. That was an interesting exercise for me to go through to see that whole way the government works. We had to do cabinet submissions, we had to respond to things, and just seeing how - and it was across portfolio policy and so how we interacted with other portfolios. And at that time, it worked really well, there was expectation that every department would come to the table representing their constituent point of view, and that was the legitimate thing. A lot of the controversy was sorted out at that level and so cabinet only got to discuss really the issues that could not be resolved and that were right at the top [of the issues].

Q: *Did you have contact with CSIRO during that period?*

A: No, very little actually. I didn't maintain my CSIRO email, I think others did; I think Paul did. I decided not to, I had to be seen to be an officer of the department.

Q: *You were there for two years?*

A: For two years, I almost stayed actually.

Q: *Can we just go back to Backing Australia's Ability, there is a sense that some people within the organisation saw that as a crisis because the government announced this new program and CSIRO wasn't mentioned so some people thought that was a crisis that had to be solved. Other people thought that it was simply the government saying that CSIRO is going all right we don't actually need to interject much more money into. So, what was your take on that?*

A: It was neither, it was about competitive grants. And really CSIRO I think was looking to boost its central appropriation. But this body of money was not about boosting central appropriation for agencies, it was about the competitive environment. And over the previous 25 years the government policy of both the coalition and Labor was to grow the component of CSIRO's budget that was exposed to competition by allowing us to and pushing us actually [to compete for these competitive funds].

Q: *With 30% external earnings?*

A: When that was dropped - but the motivation was to make sure that CSIRO actually was placed increasingly into a competitive environment for funds against other parts of the innovation system. The fact that the system itself wasn't designed very well was another issue. And I remember talking to Robin Batterham who said that he'd tried to open up the conversation with CSIRO about CSIRO's role in the innovation system, but we were not receptive at that time. And so, there wasn't an opportunity to mould and blend things into that program, I think.

Q: *Why wasn't CSIRO receptive at that time, was Malcolm still the - or was Colin Adam the chief executive?*

A: I think we were arrogant, and I think that we were disconnected from the broader environment.

Q: *The broader political environment?*

A: Yes, the political environment. I think we were inward looking, I think we believed our own rhetoric. I think we believed we were really important, which we were, but we had lost connection to our role in the innovation system and so I don't think we were receptive. And Robin was putting up ideas about us driving some commercial activity. We wanted to design what we did, we were not open to having other parts of the system helping to shape us and so I think we were unreceptive at that time.

CSIRO actually benefited from BAA because you could get money through the CRC program and other things. So I was very angry through the 2000s by Geoff Garrett and Ron Sandland's rhetoric about *Backing Australia's Ability*, I think they interpreted it in a way that worked for them and their messaging I don't think was actually true. I don't think it was a slap in the face to CSIRO I think it just was not timely, it was about competitive money that went into the system.

Q: *You've come to this conclusion partly because during that time you had an office next to Robin Batterham and you could tell from these conversations with Robin what he actually wanted to try to achieve.*

A: Yes, and also from other people in the system, yes. And I could see also what CSIRO was like, and I think we had shut the door. I was quite sympathetic to Geoff's messaging, [because] I think we had lost connection, we'd lost our way. I think we'd become so involved in just getting external funding that we'd lost our role. I mean although Malcolm in many ways was a strong leader, I don't think he was very strategic. He settled the organisation down after a very tumultuous time in the mid-90s, reconnected us into the political scene, which absolutely is important, and then I think he focused on other things. I don't think there was a strong strategic sense that he had about where the organisation was going or what it should do.

Q: *Do you think there might have been friction between Malcolm and Robin Batterham during the time when Robin Batterham was designing -*

A: No I don't think Malcolm was around.

Q2: *Malcolm wasn't around at that point.*

A: No I don't think it was; I think it was more one of the things about CSIRO at that time that I noticed, my office was next to the lift and I could see who was coming to visit Robin and every week or every fortnight the head of the ARC would be there talking to him, interacting with him. In the whole year I was there I think I saw a visit from CSIRO twice and it was never [the most] senior people, it was senior people in government business but it was just a business relationship really with the department. I don't think CSIRO understood how it might actually help shape and influence the portfolio development of these big things.

Q2: *Can we just get for the record what year we're talking about?*

A: 2001 was the year I was in the department.

Q2: *2001 and 2002*

A: 2002 was in DEST.

Q2: *So that's during Geoff Garrett -*

A: Yes Geoff came just as I came in. But it was really the history of what had gone on.

Q: *It was the time when Colin Adam was the acting chief executive that we're talking about.*

A: Yes, but it wasn't just Colin I think there had been this - the relationship between CSIRO and the department was a very low level relationship: 'let's manage the budget, let's do this and that, it was just a reporting requirement'. There was not a 'zip up' relationship up with the department, up to the secretary. I think Geoff started up some interactions more with the secretary. [Before that] we just had a very perfunctory attitude to the department, we didn't want to interact that way. I think we wanted to go directly to our minister and influence that way, but it probably ultimately wasn't the only thing we needed to do. And so, it was this lack of engagement of CSIRO deeply into the [government] which I saw later on, which evolved much later on in Geoff's term and early in Megan's term that I think was where we started to really realise how we needed to connect into the government.

Q: *While you were in the department then did you think it was part of your role to explain to the senior people in CSIRO what they should be doing or did you just observe it?*

A: I think I just observed it, I felt very important actually to be out of CSIRO. I was in the department, I was a government official and that's what I did and that's how I managed the conflict of interest. But it was very interesting to observe I must admit.

Q: *I think we'll have a break now.*

[Break]

Q: So we're back again after a brief break. We're talking about your secondment to the Division of Industry, Science and Resources and the sort of work that you did there. And you've told us a bit about attitudes to CSIRO and scientists that you saw there, and we've had a discussion about how you thought the government and the chief scientists at the time looked upon CSIRO. What sort of achievements do you think you had, looking back on that time what do you think your contribution to the national innovation system was in that couple of years that you were in the commonwealth?

A: There were two things; one was the direct task I was given in the second year, which was to help set Australia's national research priorities. I wasn't setting them, but I was head of the task force and therefore had quite a strong interaction with the minister's office and the minister himself and also with the broader stakeholder community in research and so was actually able to help that process move forward. And so, helping to set those research priorities was quite significant.

The other thing that I did was to acquire probably some very interesting insights into the innovation system and the research system myself, which later went on to influence my role as a senior and executive manager in CSIRO. So, it was also a good training ground for me to get a broader view of the research system. The thing about moving science into DEST was that it was the first time that I know of in which virtually all the research system was together in a single portfolio, medical science wasn't but the rest of it was, so CSIRO and the universities were all together. And it actually provided a fertile ground for thinking about the research system as a system and how the different parties interacted. And that was very new I think and so that was quite exciting.

Q: When you went to Industry, Science and Resources was Brendan Nelson that minister?

A: No, it was the guy from South Australia, Minchin, Nick Minchin.

Q: Minchin was the minister?

A: Yes.

Q: But when you went into DEST Brendan Nelson was the minister?

A: Yes. And I think at one stage Peter McGauran was the minister too [of DISR], so I also had some interaction with Peter McGauran, which was interesting.

Q: Did Robin Batterham the chief scientist switch to DEST as well?

A: Yes he moved across to DEST.

Q2: When you're talking about national science priorities, a very general and very broad brush, how useful were they in your view given that you knew what research actually was?

A: Research priorities can be set in two ways; you can set them very generically about the broad overarching areas we think are important for the country to do research in, in which case you can't

target all your money right down in the minutia. Or you can allocate a certain proportion of your budget to very specific research priorities, but if you do that it can only be a small percentage like 10%. So, the government, the minister had decided that he wanted these broad-brush priorities and I think it helps to shape the broad thinking of people. But it's not meant to drive individual research projects it's more about driving the system as a whole thinking about the broad areas to invest in.

Q2: *So more to agriculture less to manufacturing, that sort of level?*

A: Yes, or more to introducing more digital solutions into the innovation system or something like that, so very broad-brush areas. Or we need to do some work in nanotechnology. It's where you confuse the two [ways of setting priorities] that you get into problems with research priorities.

Q: *At the end of 2002 you came back to CSIRO.*

A: In 2003.

Q: *Sorry beginning of 2003, what did you come back to?*

A: I came back to be chief of entomology.

Q: *Paul had gone to be deputy chief executive at that point?*

A: He never came back to being chief I think, he came back to being deputy chief executive - oh sorry yes. But he had come back two years before into that role, he never came back to the division. So Jim Cullen was appointed during Paul's time away and then became the chief because Paul came back as a DCE. I replaced Jim.

Q: *Did you apply for the job as chief, how did you get the job as chief?*

A: Well that's an interesting story, I'm not sure I want to go into all the details. It was externally advertised and I applied and I was one of the four short-listed candidates; there were three of us internally and one external person I think got onto the short-list and we had exhaustive interviews. I had three rounds of interviews; there were three committees and we were interviewed - the original four were interviewed by all three committees, executive committee, a staff committee and external stakeholder committee. It was short-listed to two. And the difficulty was I think there was a preference by one of the senior people for the other person and everybody else wanted me.

Q: *So, the two short-listed people were internal?*

A: Yes. So, we reinterviewed and Geoff's style at that time was if he didn't get who he wanted he re-interviewed and you were re-interviewed.

Q: *So, Geoff wanted you did he?*

A: No.

Q: *Geoff wanted the other person?*

A: The other person yes. But I got the job finally. I was at the stage if I hadn't got that job I don't think I would have come back to CSIRO, I didn't want to come back to what I'd been before.

Q: *Did you know Geoff at that point?*

A: No, Geoff came in virtually the week I went so he and I had barely interacted. And he was quite close, I mean he'd worked closely with this other person, so he knew them, he didn't know me, and I think he saw this other person -

Q: *How had he worked closely with the other person?*

A: I'm not sure, I think he just interacted with him and they got on.

Q: *So, Geoff came in to the organisation in 2001 just as you went off.*

A: Yes.

Q: *How did the department react to the Geoff Garrett appointment?*

A: I don't recall, I don't think there was any reaction.

Q: *So, all of the first couple of years of Geoff being the chief executive you were not in the organisation.*

A: No.

Q: *So you weren't part of the turmoil of the reorganisation.*

A: No.

Q: *Anyway, so you were strongly supported by the external [interview committee]-*

A: And the internal.

Q: *And internal okay.*

A: I think Geoff just had a [great vision] - I really admire Geoff and I actually liked his vision for the organisation. He was a person very much driven by strong intuition about people and quite often he was on the money and sometimes he wasn't and I think he just had this sense this other person was what he saw the division needed and I was a different style of person.

Q: *You came in to be the chief of the division of entomology, was that for a three-year term?*

A: Yes, my background position was still indefinite but positions to management were always term positions, so it was a three-year term initially and then I was extended for a second term.

Q: Was that the standard practice in 2000 when Geoff became the chief executive to have chiefs on a three-year appointment?

A: Yes, Max Whitten in the 80s and 90s was on five-year appointments.

Q: I was always on a five.

A: No I think it was standard to be three-year appointment [with Geoff]. Geoff was in the process of changing, shifting the organisation quite substantially and so I think he quite sensibly managed the need for flexibility around these appointments.

Q: When you came in as the chief of the division of entomology on 1st January 2003 -

A: 1st February 2003.

Q: 1st February 2003 okay, was the division settled, the finances of the division settled by then?

A: Yes.

Q: What were your instructions going into this job?

A: I can't remember, I think the organisation had gone through its initial period of tumults and Geoff was very keen on introducing flagships as the key driver of the big areas we invested in. And so, my role really was to assist the division to settle into an engagement in flagships and also to assist the division to respond to these huge changes that were still going on in the organisation and went on for some years to come. So, it was really about helping to manage the division through change.

Q: Presumably the division of entomology still had the links with the cotton research?

A: Oh yes.

Q: So, your external earnings or your whole research program was still pretty much determined by the needs of the users?

A: Yes, it was still very strongly externally oriented.

Q: What incentive did your division have to be part of flagships?

A: Appropriation. One of the things that happened I think around that time I came in was that Geoff took 10% off the appropriation budget of all divisions, if I recall correctly. And in order for us to recapture that, we had to engage in flagships.

Q: Which flagships were you part of them?

A: We were part of seven I recall. The trouble for ento in this new environment was that we didn't have a central focus on an [single] industry. Our stakeholders were spread across a whole range of

sectors not just agriculture but also the environment and also manufacturing. We actually had very successful linkages to the industrial sector, to manufacturers and chemical companies and whatever. Probably had some of the biggest grants, external grants, with industry in the organisation at that time. And so, for us we were never a key part of any of the big flagships, we were a bit player in a lot. And that was not a good place to be really, so that was a challenge for us.

Q: John Oakshott was in your [Division]

A: Yes, John was very successful.

Q: And he had very strong interactions with the division at Clayton.

A: Yes.

Q: Through the crop protection chemical companies.

A: Yes. So, John was very innovative around developing new products and technologies and so on. The problem for the division was it was not a good structure to be in in this new era, it made sense in the old style, CSIRO but it was quite challenging in this new era where we had to contribute to these big questions driven by other divisions.

Q: What was your perception of the senior management of the organisation, as the chief of the division what role did you play in interacting with the deputy chief executives and the chief executive in determining the future of the organisation. For example, were you much involved in the flagship, in the move to flagships, did you have a say in whether that was a good idea or not?

A: No, that was already pre-determined, that was pre-cooked [before my return in 2003]. But what was interesting to me was originally I think the intention was that we'd only take part of the organisation into flagships and the other parts would exist doing the broad science we'd already done. Later on, there was a push to make all the organisation into flagships, and I opposed that idea. And so, I had a role in influencing that, but unsuccessfully as it turns out. So, no initially I didn't have, it was already established there were six flagships, what they were, that they were going to happen. And my role was actually to make it happen, help it happen and help my division be part of that. And resisting it was stupid.

Q: *Throughout the early part of the 2000s the existence of flagships meant that a sort of matrix management system had to evolve. How did you as the chief of the division cope with this matrix because as I understand from what you've been saying you weren't the leader of any of the flagships, your division was a contributor to seven flagships and so therefore intimately involved in a matrix. How did that work and how did the role of your program managers in your division management interact with the management of the flagships, in particular the flow of money?*

A: It changed over time. In the early days it was quite easy to follow because most of the division's money was still coming in three-quarters through its standard source and only small amounts were coming in through flagships. What I did, and it was a bit of chaos internally in the

division, is I restructured the division. Jim had totally taken out any structure in the division so it was very flat, he had something like 30 people reporting to him; and I said that's impossible.

Q: *He didn't have programs?*

A: No, that was part of his evolution to try to solve some of the division's problems. That was probably a good transition period. And I had to reconstitute programs in a way and there was a lot of resistance to that. We structured ourselves in a certain way, we made key decisions based on information about where the organisation was going. And then about three years in it completely reversed at very short notice its investment strategy, which made the way we had structured ourselves to be inappropriate, so we had to restructure ourselves within six months again.

Q: *So, CSIRO changed its investment strategy?*

A: Yes, the mechanics of it. It had been that up to 2004 or something you could have a divisional theme sitting beside a flagship theme and they could be doing the same thing. At that time the organisation made a decision that you had to have pure themes and so all the activity if it was a flagship had a theme, everything you did in that area had to be in the theme of the flagship. So, the divisional themes had to be quite distinct. And we had set ourselves up in one way and then suddenly found out six months later we had to change.

Q: *You say the organisation made this decision but you as the chief of the division of entomology weren't part of that decision making?*

A: No, and I think that had been one of the big changes that Geoff had - his early style was that - previously the chiefs had a huge role in decision making and they were really the engine room running the organisation. I think it would be fair to say in the first half of Geoff's time he completely almost disengaged that part of the organisation from being the influencers in decisions, they were the recipients of decisions. Geoff had a much stronger comfort around the corporate role, and if you look at his executive at that time it shifted from having a strong emphasis around science leaders to having corporate leaders. And so, things were centralised, decisions were taken in a centralised way that did not involve the chiefs.

Q: *So, you were part of the executive team?*

A: The executive management council, yes. We were recipients of information.

Q2: *So, you weren't a deliberative body?*

A: No, we turned up and were told what was going to happen. And I got into trouble because I used to stand up and object; and that was viewed as disruptive. There were other chiefs in the organisation who really got into quite a lot of strife, you've probably interviewed some of them, because they were prepared to stand up and speak their mind. And that was not what was required, you went to these meetings, monthly meetings or bi-monthly meetings, to be told about the changes that were being rolled out and what you had to do.

Q2: *Who was in the decision-making group?*

A: I don't know really.

Q: *Were they the deputy chief executives?*

A: Well there weren't any.

Q: *Okay so there was Geoff, and Ron was the deputy chief executive.*

A: Yes, Ron and other people.

Q: *And there were group managers or there was someone in charge of divisions?*

A: There was the group chairs as they were called and as far as I could see weren't involved [in decision making].

Q: *Oh, they weren't part of this group either?*

A: No because they weren't formally recognised, and when I became a group exec in 2007 that was really when [the role of Group executives as] line managers was recognised. [Group Executive roles replaced Group Chairs sometime around 2005; but the role was rapidly evolving from strategy role to one that included extensive line management in 2007].

Q: *Who was your group, when you were the chief, who was your group exec?*

A: Group chair, there was no group exec, there was a group chair and the group chair was not part of the executive.

Q: *Who was your group chair?*

A: It started off being Steve Morton I think.

Q: *And that rotated.*

A: Yes [in principle]. Later, I ended up [reporting to] Michael Eyles [when we moved into agribusiness], but I think it was Steve Morton [when we were in the Environment Group]. But Steve was also a chief. At the same time, he was group chair he was also a chief, so it was just a coordinating role, it was a very weak position it had no decision-making capacity at all.

Q: *So, who was actually running the joint?*

A: Geoff and the coterie of senior corporate managers I think with Ron [Sandland].

Q2: *Who was in the coterie?*

Q: Well Mark Whelan.

A: No, [not initially as] well I helped to recruit Mark actually, I was on his interview panel. So yes. the corporate exec, I mean the corporate, the people who were running corporate functions.

Q: *Was Mehrdad there?*

A: Mehrdad was there, yes Mehrdad was very important. So Ron and Mehrdad and others like that around Geoff were very important. Look, partly that was because he [Geoff] wanted to drive huge change through the organisation so it had to be centralised so I could understand the rationale but it meant that there was - because he had to take the decision making, which was very distributed and he wanted to bring it in to make big changes and then over time it became more distributed again. That may be a more generous view than many people give you, but I actually can see from a distance it wasn't bad.

Q: *But if you were not making the right decisions, it was what you had to do.*

A: Because Geoff wanted to turn this organisation 90 degrees, he wanted to change us around completely and there was huge resistance, and only someone like him actually could do that, I think.

Q: *When you say that he wanted to change the organisation, did he succeed in doing that?*

A: Yes. This organisation was a very different place by 2010 than it was in 2000, and it was for the better I think, by and large.

Q: *In what way was it different?*

A: Well I think Geoff took us back to our roots. And I remember standing up quite passionately for this.

Q: *What does that mean?*

A: Well I'll tell you, I was at an executive management council meeting and we were talking about what was the role of the organisation. And I stood up and I actually said it was to actually deal with national challenges and opportunities for this whole country, that was our role. We had to work where you needed a large body of people to really focus on the big issues. It wasn't to do piddling little grant things over here or this over there. And that was really what Geoff was trying to do, he was trying to get us to think about what were the top six or 10 or 12 big issues and opportunities in this country that this organisation needed to put its whole weight behind and its strategies and its investments and its people. And we had lost that.

Q: *When had we lost that?*

A: We lost it gradually probably certainly over the 80s and 90s I think driven by external revenue targets and the decreasing value of our appropriation budget. Up to the 70s the government wanted to invest in a new area important to the country, it would invest in a new division of CSIRO. Starting from the 80s it started to invest in the university sector, it needed to build that

sector, it didn't want to grow its total investment in R&D and so we lost out. And you can see that from time the percentage of total R&D spent in CSIRO starts to decline and the value of our appropriation declined by roughly one and a half percent per annum over about two decades.

Q2: *In real terms?*

A: In real terms yes.

Q: *And as a percentage of the government's total expenditure it dropped even - very much greater.*

A: It was a very conscious effort I think by governments and also to force us to get a proportion of our money through competitive means. And I think through that we lost our key focus on the big issues, the big drivers. And I think the whole point of the flagships was to say what are the big issues we want to focus on and then invest heavily in that. And we did some phenomenal work in the 2000s in the environment area, where I was really familiar with, that was just ground-breaking, and we could never have done that in the old structure.

Q: *You say in the interview with Alice Garner that being the chief of the division was the best job in the organisation, is it still?*

A: I actually was thinking about this, it's a split between the chief and the group exec role, which I also enjoyed very much. So those very senior roles I enjoyed very much because you had a lot of capacity for influence.

Q: *But to some extent what you've been telling us seems to be in contradiction to that idea that it's the best role because you're saying that the job of the chief diminished somewhat under Geoff's leadership. When Max was the chief he was in charge of this - he was almost autonomous and by the time you became the chief you were somewhat down the hierarchy of important people in the organisation.*

A: But I was then in a hierarchy of an organisation that was focusing at a much higher level on the bigger issues of this country and therefore I had a capacity to help direct this organisation around those. And so, it's a question of whether you want to be a really big fish in a little pond or whether you were prepared to put up with a slightly smaller fish in a much, much bigger pond. And I think that's what Geoff was doing was putting us in a bigger pond and changing things. But I also had a lot of influence on the people in my division and how they responded to these changes.

Q: *Can you just reiterate for us the management structure at the time, you're saying to us that you sometimes got up and irritated the senior management by your outspokenness, but in 2007 after you'd been the chief for four years Geoff invited you to be the group executive of agribusiness.*

A: Well I was interviewed.

Q: *You were interviewed for it. Was that a new position?*

A: The group execs had been created a bit before but the role itself was still evolving. In the first 12 months - there was a whole group of us, Geoff was replacing his executives particularly in the science areas and I think because it needed refreshing because a lot of our predecessors were getting close to retirement Geoff saw the need to refresh. And he wanted to do that before the end of his term. So, there was a whole [new] group of us coming in and in the first 12 months we actually had to work through with Geoff what our role was and how it would function, and I think it never really settled fully until probably Megan Clark came in. So, [in 2007] there was still all these lines of management and control that bypassed the chief and actually bypassed the group executive, but we were gradually trying to get that sorted out.

Q: *That was the flagships was it?*

A: No it was anything. I remember a deal going to ComEx, the commercial body that oversaw commercial transactions, for a \$100 million project that I had not actually engaged with and I was the group exec! The process was the divisional business manager took it to ComEx, it then went up into the business office, it went up to the CEO, and you could be totally cut out of those loops and so there was all sorts of stuff going out. I had people being made redundant that I didn't know about.

Q: *As the group executive?*

A: And as the chief of division.

Q: *And as the chief.*

A: And so, you'd go 'holy gee'. So, the processes had been set up to bypass that line management structure through these corporate functions. And that was changing back [in 2007] as I became group exec and so we getting that because - and Mike Whelan had a huge influence on that because he was very much about [good line management and accountability].

Q2: *Influence for the good?*

A: For the good, so basically if you want these guys to be accountable, which we're now holding -

Q: *When did Mike Whelan come into the organisation?*

A: It must have been about 2004 because I was on his selection panel, he came in as CFO. And then with the changeovers that went on in Geoff's second term when Ron retired, Geoff made both he and Alastair Robertson the deputy chief executives.

Q: *Alastair Robertson was -*

A: My predecessor.

Q: *He was a group executive?*

A: Yeah he was my predecessor.

Q: *At agribusiness?*

A: Yes my predecessor.

Q: *So there must have been a time when this stopped being a rotating position amongst chiefs?*

A: Yes it stopped actually -

Q: *And he was the first?*

A: No I think Michael Eyles was. And so it was interesting, my three predecessors were all head of food science. [Chris Mallet was DCE overseeing agriculture was from food and nutrition]

Q: *So you became in 2007 the group executive agribusiness. Geoff was still the chief executive. Was it a surprise when you got that position, did you think that was the natural development of your career, I mean what made you go from chief to group executive?*

A: I was interested, Alastair had approached me about applying for the role and I did so.

Q: *Did you enjoy it and what were your achievements and disappointments in that role?*

A: I enjoyed it very much. Actually, it was a very challenging role, I enjoyed being at the top of the organisation and being able to really have an influence across it. Achievements are actually interesting; I spent a number of years dismantling joint ventures that were past their use by date. And that might seem like a very odd thing to see as an achievement, but the group needed to evolve, needed to move forward and shift its investment.

Q: Joint ventures with private companies or with -?

A: Other research institutes. And one of them I did in the division was with the grains industry and it was a longstanding one, Food Science Australia was six years old I think or maybe 10 years old and ENSIS was three years old. It was very challenging because there was a lot of resistance to doing that, and it was the right thing to do.

Q: *ENSIS was the forestry, the one with New Zealand?*

A: Yes. It was done in response to Food Science Australia initially being very successful and the right thing to do. But they'd got to a point where they were no longer the right thing because they were set up at a time before flagships. The organisation was going into a new totally new way of investing, its whole mechanics of investment had totally changed, with a totally new structure; these joint ventures didn't fit and so they were kind of being torn asunder by internal process. Not because anybody wanted to do that, but they just were. And there were some leadership challenges around them too. It was the right thing to do, I faced a lot of resistance, but I did - not so much around ENSIS but more around FSA. But yes it finally worked. And I think that was a great achievement to do because it allowed those whole areas of science to actually evolve appropriately.

Q: *If we go back to a little bit of the history of the management of CSIRO, in the 70s we had the Birch Report indicating that the organisation should be reorganised. We had the ASTEC review in the 80s and the McKinsey restructure in the 90s. We had that process led by Roy Green and Bob Fraser in developing the way that the organisation was managed under Malcolm McIntosh with sectors and so on. What you're describing while Geoff Garrett was the chief there was not much external advice coming to the organisation how it should restructure. Was it all done internally and what were the processes that went on to decide that you were going to have group executives, how did that role evolve, was it all internally determined or was there some external advice?*

A: I don't think there was a formal review, but I think Geoff was very good at bringing new people into the organisation and there was almost a huge turnover of people at EMC level over a three-year period. And he had people like Mehrdad Baghai come into the organisation for a period of time and other very senior influential people. Although the advice technically then was internal it was actually by bringing these voices in, these new people in from the outside who were quite visionary in many cases, that he was able to get a lot of advice about structure and function and direction. And part of it I think was Geoff knowing that he had to take the organisation through a transition with a view as to what the end game might look like. And so yes, I think it was a lot of input from a lot of people who had been outside the organisation, but they were probably inside the organisation when they made the decisions.

Q: *During this period the composition of the board - Catherine Livingstone became the I think the - Charles Allen was the chairman of the board when Geoff Garrett was appointed, Catherine Livingstone became the chair, did you have any sense of how much the board was influencing the direction of the organisation, as the group executive for example did you have an interaction with the board?*

A: Yes, I did particularly as I had a number of changes that had to go to board level, and I had to present them to the board. Look, I think Geoff had quite a strong influence on the organisation, I think there was probably some tension between he and the board, which is expected because you're undergoing huge change and I think it was driven more by the CEO than by the board. And CSIRO has always been a bit funny in that way, it's not a company. So, I think the expectation in reality is that the CEO will drive the organisation much more than necessarily the board despite what our legislation says. Because the minister would ring up the CEO directly and deal directly with them. The board had influence and helped to set overarching strategy, but I think Geoff had quite a lot of influence at the board level and on the changes the organisation made.

Q: *So that whole process of changing structures evolved rather than being part of a strategic plan or a strategy is that what you're saying to us?*

A: Yes, I think so. Geoff's great strength was his strategic vision around where the organisation needed to go and what it needed to do and how it needed to function relate more broadly in the innovation system. His focus was not on the details of implementation, so Ron Sandland provided a lot of that structure to begin with and they worked very well together. To change an organisation so drastically you can only plan to a certain level of detail and then you've got to back it up with a responsiveness to things as they're occurring and a continuing evaluation of what's

happening, where are the problems, how do we deal with them. And I think what you can see in this evolving structure is because the organisation had key people in it at a senior level able to do that and influence the system, people like Mike Whelan and Ron Sandland and Alastair Robertson played a key role in helping to shape the way the organisation was evolving. But it had to evolve rather than having -

Q: But unless you can bring the chiefs with you and have them fully supporting where it's all going it's not going to work.

A: I don't agree because Geoff had changed the role of the chiefs, you actually now had flagship directors who were equals and so you need to have flagship directors and chiefs. And one of the reasons I think we went to a complete flagship model was to simplify that structure.

Q: Was it something to do with the relationship between chiefs and the chief executive?

A: No I think it had - chiefs had changed their role, I don't think it's anything to do with that. We went to a flagship model because of the belief that that was the way to do your investment and it was a much simpler structure than actually having divisions and flagships.

Q: I'm sorry to persist with this but the difference between being a flagship director and being a chief how do you perceive that?

A: They were quite different in the chief had responsibilities for people, for capability, that was one of their roles. And they had some responsibilities for the science and projects but that role diminished over time. And flagship directors had responsibilities for projects and identifying opportunities and where to invest. And so, because flagships went from 15% of the organisation to 100% of the organisation that dynamic had to clearly change over time.

Q: Being responsible for people is huge.

A: It is, but you see the other thing about chiefs is that Geoff changed all his chiefs essentially so all the new cadre of chiefs in 2000s were new the organisation, a lot of them external, as it was now rather than what it had been in the 90s. And so that's important, we couldn't be that organisation. I'm not a great fan of going back to the 80s, I don't want to have a set of autonomous divisions I don't think that was the way to go. So, I was very supportive of Geoff's direction, I had some issues around some of the implementation, that was a bit bumpy at times.

Q: My role in the organisation now overlaps a bit with yours because in 2008 I became a member of the board, so I started to interact with you as the group executive agribusiness. My impression of the organisation in 2008 was that it was very complicated.

A: It was very complicated - we've had worse.

And that people, a scientist in a division had no idea who their boss was, what they were supposed to be doing. So a senior scientist in a division might be part of four or five different projects and have a manager here for 20% of their time, a manager somewhere else for another 25% of their

time so it was a very confusing - my impression talking to the scientists it was a very confusing time for the scientists especially in divisions like entomology and molecular science.

For the maths and stats yes.

Divisions that were providing capability across a range of different business systems.

I think that's true, but it was less confusing I think for many because - it goes to personalities, some people in that environment just accepted the confusion and got on with their job but other people were overwhelmed by it, and I think it depended on the person. We tried to limit the number of project areas a person contributed to.

Q: 'We' being?

The division.

This is when you were the chief of the division?

Yes, and also when I talked to the divisional chiefs they were trying to manage their staff so they didn't end up in this totally confused environment. Yes there was a period where the confusion got worse and worse. But it takes a while to settle, it takes a while to work out - when I first became chief if you looked at the staff survey there was very high rejection of flagships as a model and three years later much higher acceptance. And if you go another three years it was very high acceptance. And so, people took a while to adjust to these changes. It was a big change in the organisation but yes.

What do you think was Geoff's main legacy to the organisation?

I think to redirect the organisation around big issues, to refocus its energy and to say that we had to actually be - we were different to universities, we weren't a university without students, we had to pick on the really big issues and assemble big teams to address these issues.

Megan Clark became the chief executive in 2009 and you were the group executive agribusiness at that time. How did you see that change take place, were you surprised that Megan became the chief executive?

I didn't really have a view either way I think, I was quite accepting. The great thing about Megan I think particularly was that she was very financially savvy and very savvy about organisational how to run itself. And she brought in some really good vision about some of the key issues and problems we had. Because she could read a balance sheet and financial statements, she was very savvy in that. She worked out there were some structural problems, serious structural problems, developing in the budget and she made it her mission to solve that and get the organisation back into a budget structure that was enduring, and I think she did that very competently, very well. And she was forceful, she could do that.

Did you get on all right with her?

Yes, I did. Ultimately, she decided I wasn't the person she wanted in the job, and yes that was hard to take in a way but she wanted someone - I don't have a commercial background.

How long had you been the group executive, when she came into that role-

Probably about 18 months I think.

When she became the chief executive you'd been there for 18 months or so?

Yes.

And you stayed on for a couple of years?

Yes another 18 months I think, or another 20 months or 24 months. I think Megan was looking - like any new CEO they look at their execs and they work out who they want to keep and what changes they want. I think she wanted a much more commercial person in my role. I had never really been a commercially oriented person, I'd come through policy matters sort of public sector areas. And so, she was interested in retaining me but not in that role. And she signalled that fairly early, but I retained the role for another 20 months, I think.

What changes did she bring to the organisation in your opinion?

A: Huge rigour around finances and a strong sense of professionalism around the executive team around the way we functioned, decision-making. Geoff was a much more intuitive person, Megan was much more willing to understand that organisations need structure, they need due process, so she did those things very well, I think.

Q: *So, she retained the flagship division model, the matrix model.*

A: Until close to the end yes.

Q: *You're saying that she brought a rigour into the management of the organisation. But that matrix model was fraught with difficulties, which to some extent she kept the difficulties but increased the rigour of how that was managed.*

A: Taking an organisation into a matrix is big work and it can take a decade, and so the fact that there were problems doesn't worry me it's more how you solve them and where you're taking the organisation. And I think she was nervous about [a full matrix] - Geoff had made a decision before she came in to take the organisation - well he'd been persuaded I think to take the organisation fully into a full matrix and I think he was not as committed to that as others around him, but that's what we did. And so, she inherited this organisation that actually had all research projects were virtually done in the flagships and capability was held in the divisions. It was very complex, and I think a lot of people in the organisation didn't really understand how the money flowed, and that was a big problem.

And I think towards the end of her time as CEO she was persuaded, I think, to shift away from that and to come back to single structures that we now have in the organisation because we couldn't

solve the problems that this very complicated system had. And a lot of it was because we introduced the matrix before we had the business systems that could support it. We were still running on the old accounting system, we didn't introduce SAP until halfway through 2008. So, we just didn't have the support structures in place that could help us manage a matrix, and so that ultimately, I think was the logistics of it that killed it.

Q: Did we have the expertise in the financial sections of head office to do this?

A: Yes, they had it, but you can't run a matrix without that expertise coming right down into the organisation. I remember one time, I don't know if I should say this on tape, having my bonus penalised one year because my group had lost three million dollars or whatever. Well I knew where the three million dollars was, it was in another group and the reason it was in another group is because that group hadn't effort logged into my group and so it wasn't my fault. But I couldn't get the CEO at the time to understand that, so I got penalised and the other person got my bonus, a bit of my bonus. Because no one at that level in the executive other than probably the CFO really understood how the money flowed and the perverse things that could go on. So somehow or other we managed to get - somebody made a decision to tie intimately effort logging to the general ledger. Well you can't do that unless - I mean certainly not in a science organisation, it was a completely horrible thing to do. And so, we lost control of that and so we had to make some pragmatic decisions about how to solve that, and I think ultimately the organisation decided to come out of the matrix.

Q: What was the last job that you had in the organisation, you stopped being the chief executive agribusiness and you were in charge of?

A: I went back into strategic advisor role and Megan had asked me to look into the notion of trying to set up - what to do with the collections, and I'd become quite interested in our big collections and should we set up a natural history museum in Australia. And I did that work for some years. One of the things I learnt is that unless the executive is lined up behind a decision, you're wasting your time. And I think there was no appetite outside Megan for any kind of new way of [managing collections]- and it wasn't tied into the government to think about a national natural history museum.

Q: Did you decide to leave CSIRO at some stage in that process?

A: There was some issues going on in my personal life, my husband in 2011 had malignant melanoma with an unknown lifespan and it was about the time I was looking to change job outside the organisation but I decided to focus on his health. Also about the same time my brother got stage four cancer, and so all that personal stuff make me decide I couldn't go into another high powered position and so I was quite interested in doing the work I was doing in CSIRO and so I remained. I think about 2015 I'd reached a point where I'd done what I could do, and I knew I needed to think about retiring and the organisation approached me also about whether I would retire.

Q: You were never part of the organisation when Larry was the chief executive?

A: Larry was around, yes Larry would have been around for six months, yes I think he'd just come in.

Q: *In 2015?*

A: Yes, I retired on 1st December 2015.

Q: *So Craig Roy was the [deputy] chief executive.*

A: I got on with Craig really well.

Q: *How did you get on with Craig and what interactions did you have with him?*

A: I got on with Craig very well actually. It was interesting, when I first joined the executive he joined about the same time and he was a breath of fresh air because he was this very [calm person]- the previous executive was very cantankerous and aggressive, and Craig just came in and said we're not going to behave that way. And he was able to, and he had Geoff's respect, come in and really help set the tone of interactions at that executive level. And I continued to get on well with him over the years. When I stepped down as group exec, I reported to him for a while, he and I got on well.

Q: *Can we just go back to this interaction of CSIRO with the government, so Geoff had quite a different approach to the government than you're describing in the early part of the 2000s so how did Geoff influence the government?*

A: I think Geoff was prepared to work across government. I think one of the mistakes the organisation had made is at the very senior levels of government we tended to go through our portfolio whereas Geoff was prepared to go out and talk with the secretaries of a whole range of departments. So, we would have regular high-level meetings at lunches where he'd invite the secretary and his dep secs from a given department to come in and meet with the relevant executives and chiefs.

Q: *John Stocker did that in the beginning of 1990.*

A: Yes and I was less familiar with that. But Geoff did that, so he was very keen at re-engaging at the most senior level. And he was very interested in listening to why hadn't we had influence with government, and we heard some pretty tough messages at times. Geoff also was prepared to engage with Department of Finance very directly and had very senior people also do that interaction. So he, I think, opened us up to listening to government and being influenced by that and seeing our role as - I remember one secretary came to a meeting and said look CSIRO we want you out there, we want you out there talking about climate change and other things because we can't go out there in the same way. We want you to help set the policy agenda, you can do that that's your role. Don't stand up and criticise government because that's not your role but go out there and have the conversations. And I think that was quite interesting to hear that that's what they wanted us to do. But they wanted us to tell them before we started to release reports, the 'no surprises rule' is key in government. So, I think Geoff helped to foster that environment.

Q: Megan Clark became chief executive and you were there for actually most of her time as chief executive.

A: About half the time yes.

Q: You were in the organisation all the time she was the chief executive, you were a group executive for half the time.

A: Yes I interacted with her all the time.

Q: What is her legacy to the organisation?

A: It's a very personal view; I think it was about this helping the organisation to settle down into its new structures, into making itself work as an organisation and then allowing Larry to come in and take it off in another direction.

In a much more rigorous approach to understanding what was going on.

Yes.

She had that with your project too; and with the Wi-Fi project.

Yes.

Since you left CSIRO what have you been doing?

I am partly retired actually, so I'm travelling more and doing personal things, but I'm also freelancing.

I don't know the answer to this, did your husband recover?

Oh yes, it was quite a miracle but he's still actively working so yes, he's fine. He actually employs me, I do my work through his consulting company just for convenience. But I work across the agricultural sector particularly; and also in the area of national collections; and I am doing work for government departments

So, you're freelancing.

I'm a freelancing consultant doing strategic work in agriculture particularly with a focus on biosecurity.

As a freelance consultant in the areas that CSIRO works, from the outside, what's your view of the organisation? Let me just go back to something that you said earlier, in 2000 you thought that CSIRO was very arrogant is it still arrogant?

A little bit but not a lot, I think. I think it's very hard when you've got such a body of achievement and such a group of people not to have a measure of arrogance about yourself particularly when

you've got critical mass in areas. I think in other ways we're unassuming and I think we don't realise how much people appreciate us as an organisation, yet they don't really understand the big things we do.

One of the things I did do in my early retirement and also the last year I was in CSIRO was to help develop an initiative with the ANU in plant sciences particularly. It fascinated me because if you had gone around Australia and asked researchers where was the leading plant science activity in Australia, they would not have mentioned Canberra, but the ACT CSIRO and ANU together we are world leading. CSIRO plant sciences is in the top 10 worldwide and yet you would not get that response from others in Australia. And I think it's the same thing for other areas of science, we're not known - I mean they know we're important but they don't always know just how influential we are.

But the other thing I realised working outside the organisation is people look to the organisation for leadership and we often step back, we don't step in enough because they dislike us [to take over]-

Leadership in scientific areas?

In scientific areas and in broad development, science behind policy. And I think it's because we've got a distributed system and people need some party to actually step in and help drive things; CSIRO has a national mandate and people just want us to do that, they hate us doing it but they want us doing it. And I think we don't always do it when we should.

So, if you were advising the minister, the prime minister, now on Australia's national innovation system would you still have CSIRO?

Yes I would.

What would CSIRO do?

Probably pretty much what it's doing, I'd probably give it a little bit more money because I think it's being pushed to its limits. The trouble for the innovation system is it makes assumptions about the funding structures of different institutions. And they're not all the same and so there are some elements of the innovation system which have received a lot of funding over the last decade that oriented more towards the way universities work and disadvantaged CSIRO, but I don't think people realise that. And so, we get criticised as an organisation for being too expensive because when we charge full cost recovery, we're expensive. But people don't realise the extent to which universities cross-subsidise research through their teaching and how much they get extra money when they get external grants.

When you say people don't recognise that, the customers for research?

Yes and in government or wherever, or people know it but they don't take it into account. So, I think they don't realise the reason we are expensive, and people say you're so expensive, yes you

do solve the problems and you deliver but you're so expensive. And I go yes well that's because the cost we charge you is truly the cost of doing research.

You mentioned when you were in the period of secondment in the department that Backing Australia's Ability was really aimed at part of the competitive grant system, would you have CSIRO more in the competitive grants area or would you have a model where CSIRO was outside that competitive grants and had its funding from the government to solve particular problems.

I actually like a hybrid system, I think it's essential that CSIRO gets core funding as do universities because you just have to run yourself and there's certain things you need to do within your own mandate. But I don't mind CSIRO being in the [competitive grants system] - I think it's good to be in a competitive system but the competitive system has to acknowledge the drivers and the funding models that drive those institutions. And so, it has to acknowledge that CSIRO does not get additional resources apart from its appropriation, and that appropriation has to run its buildings, pay its electricity bills, pay for whatever. So funders have to understand that.

In a competitive environment we are disadvantaged at present because universities can charge very little for doing a body of research because they're not reflecting fully the cost of doing that research in it. I think we should be competitive, but it has to be a level playing field and it's not anywhere near that and there's no appetite to make it a level playing field, so it's a challenge.

Reflecting on your view about the CSIRO still being important and remembering the controversy that happened a couple of years ago when CSIRO tried to pull back on its climate change work and the outrage from the community. Should CSIRO have a level of appropriation that allows it to do long-term research for which there's not necessarily any paying customer?

I think the answer is yes, but I wouldn't - but I think that can be over-egged, I think people - I get fed up with being told by universities that big discoveries come out of blue sky research. Yes, they do and big discoveries also come out of applied research. So, I think CSIRO needs to have a capacity to refresh and renew its science and to start up new areas of science and it can only do that probably on appropriation. But I don't think we need to over emphasise that. I saw big problems when I was group exec that we couldn't rejuvenate certain areas, we had to shut them down, because we didn't have the resources to rejuvenate them; it costs money to rejuvenate.

And they were important?

Yes, they were potentially important. We had to make choices; this is in the food area we had to make choices. And I think sometimes CSIRO cuts things because it's having to make choices about priorities and once we've invested heavily in an area you have a stakeholder community that wants to continue the investment. Now putting aside whether we should cut climate science or not what was happening is in the early 2000s Geoff was able to bring new money into the organisation, there was significant investment in environment around water, around climate change doing some fantastic stuff. But eventually you've got to work out, if you've got a set pie you've got to work out well maybe it has to take some cuts so we can reinvest in other areas

which now are really critical. And so that's the problem for the organisation, people don't like making choices but we have to.

I think that's right, but I guess what I'm conscious of is that Australia as a country is custodian of this huge continent and all the waters around it and the air above it, there is just an enormous body of work that's required to understand and manage that colossal resource and not particularly people who are going to stump up money to pay for it except government through appropriation.

It doesn't have to be appropriation, it can be more directed. I think some of the most seminal work we did over the last 20 years has been the big water catchment modelling in which we're able to do the projections of future water yields from those catchments right across the country, huge project I think it was a \$12 million project or whatever. It brought together CSIRO with a number of state jurisdictions and whatever and we solved some big problems, did some fantastic science, and that was externally funded. I think that's okay, but you can't do it by a series of short-term contracts. But I think it's okay for government to say we're going to give you x dollars because we want you to go and solve this problem or do that or work in this area. That's what it used to do I guess by setting up these new divisions but I don't think just giving us a blank cheque for everything is the way to go either, I think we do need a blank cheque [for some of our funding] but it's okay for us to have to go out and compete. But government has to free up some money through its departments to invest also.

Joanne that was a very comprehensive survey of your career and your contributions to the CSIRO and to the national innovation system so thank you very much for spending all this time with us.

Thank you.

[END OF TRANSCRIPT]