



CSIRO Oral History Collection

Edited transcript of interview with Catherine Money

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Location: Swinburne University of Technology (Melbourne, Victoria)

Interviewers: Tom Spurling and Terry Healy



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Catherine Anne Money PSM, MSc (UoM)

Summary of interview

Catherine Money was born in Melbourne on 18 August 1940. In the first part of the interview Catherine recalls growing up during the war in Balwyn where her father was a young barrister working as the secretary of the Australian Defence Committee. She talks about her time in isolation with scarlet fever at the Fairfield Infectious Diseases Hospital, her early education at the progressive Preshil school, and her primary and secondary education at Fintona Girls School. Her family encouraged her interest in science.

Catherine then discusses her time at the University of Melbourne, her growing interest in biochemistry and her decision to do her master's degree at UoM. She talks about her family decision to go to London for her husband to complete his teacher education and her research work at a London hospital.

She returned to Melbourne and very quickly secured an Experimental Officer position at the CSIRO Division of Protein Chemistry. She emphasises the importance of the support of her Chief, Gordon Lennox in her early days in the Division and especially when she started her family.

In the later parts of the interview Catherine discusses her very productive interactions with the leather industry and the way that CSIRO's approach to industrial research changed in the course of her career.

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Introduction and early life in wartime Balwyn

This is an interview with Catherine Money for the CSIRO history project, Oral History Collection.

It's the 8th of December 2021 and we're in an office at Swinburne University of Technology. I'm Tom Spurling and with me is Terry Healy. Thank you very much Catherine 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 be only given in accordance with the instructions that you have given us in the rights agreement.

Quite happy with that.

Okay. Thank you and we'll thank you very much again for agreeing to take part in this history project. In these oral histories we talk a bit about your early life and influences and experiences, your career before and after CSIRO and your views on the role of CSIRO when you're in it and something about the evolving role that CSIRO might have in the future. So let's start at the beginning. Can you tell us a bit about your early life, your parents, siblings, family, primary school experiences?

Right. Well, my parents were Douglas and Helen Menzies and I was the second child of four. I had an older sister than me, then a brother, then another sister and I was born during the war in 1940 and at that time...

Was that in Melbourne?

In Melbourne yes and we lived in Balwyn and at that time my father was a young barrister struggling a bit and when war started he couldn't go to the war so he wanted to get a job that was useful and he became secretary of the Australian Defence Committee and the chiefs of staff committee. So there were chiefs of staff from other countries. So he spent a lot of time at the barracks in St. Kilda Road from 1941 to 1945.

When you say secretary, what did that mean?

Well, I think he went and...he had letters that he kept. He kept very few, but he kept four thanking him for being a wonderful secretary. So he kept all minutes of all their meetings...

So he's like the company secretary?

Yeah he was like a company secretary. And so there were overseas chiefs of staff as well there. And so we saw quite a lot of him that he was based down the barracks on St. Kilda Road. And my mother had been a kindergarten teacher, and during the war, she set up a creche every Wednesday at our place. And she would take children of anybody whose father was at the war to give the mothers time, and we didn't like it much because they came over and took over our toys and everything else. But it was something she was remembered for in the community, and she went on helping in the community and she started the local kindergarten.

So she was Helen...

Helen Borland. Her father came out to Australia and she came with him. He was the Minister at Scot's Church and had a big part in the Presbyterian Church of Melbourne. And so my big learning experience of the world for me was I got scarlet fever and I had to go into Fairfield Hospital and I'm sure this shaped me. I was put into a cot whereas at home I was in a bed and I couldn't move and I came home with these incredible stories but in the end when I came out, my parents didn't have enough money for a taxi so my father rode his bike from Deepdene to Fairfield. And I can remember

coming down a slide. I came down this chute and all my belongings were kept. All the toys I was given were kept and I came down and I came home on the back of his bike. And he had two chocolate frogs for the trip. So that affected me having to leave the family at that time.

So how long were you in Fairfield Hospital for?

Look, I'm not sure and I didn't ever write it down but it seemed a very long time to me and I...

So how old were you then?

I was three.

So 1943?

Yeah and my brother was one and my mother was pregnant with my younger sister so and she was doing all these things as well. But they sent me something every day but of course they couldn't visit me in Fairfield. But I was very spoilt.

Early experience of a lockdown?

That's right. A real lockdown and with no one there really to help you through it. When I recovered from that, my older sister was at Preshil. My mother knew the people who ran Preshil School and she was there at kindergarten and I started there very early...

So Preshil is a progressive school of some sort?

Yes, a progressive school and it was very progressive at that time. The girls went there till ready to start school and I then went to Fintona after Preshil. And Fintona was a really good school for me.

So that was your secondary school?

And primary school. I only went to preschool as kindergarten really two to four, and at four I started at Fintona and I made friends then that I met last week for a lunch we had a picnic lunch. We're still great friends from back then. And I went through the junior school owned by Margaret Cunningham (who also was a friend of my mother's) and it was really another progressive school but she ran it independently.

Okay so she owned the school?

She owned the school and she ended up giving it to the old girls and the old girls...

And are you still involved with running this part of the..?

No I didn't go on. I got involved with our children's schools and we didn't send our daughter to Fintona. It was too hard from Hawthorn where we are, so I kept in touch but I didn't have an ongoing involvement. But I did get involved with my children's education because of the creche that they went to first, and then I was on the committee and I was in charge of employing staff then as primary school I got on the school council and then at John Gardiner High School I became chairman of the school council there.

So do you remember Jeff Wunderlich?

Yes

He was very much involved with John Gardiner [High School].

Yes he was. He was terrific and yes - so my husband taught at John Gardiner for a while but before our kids went there and so he was very involved with the staff and I became very friendly with Betna Dryden who was the Principal there. And so it was a big involvement.

So when you look a bit at your family, there are a lot of lawyers in it, but you became interested in science. How did you become interested in science? Was that part of your primary, secondary or what was your motivation to become a scientist?

Well [it] started in primary. I was really interested in how things worked and for some reason started off saying very early that I wanted to be a scientist. I don't know who influenced me on that. But when I got a Brownie camera and started taking photographs, then I found that you could develop your own photographs and I started doing that under our stairs in some dark cupboard and I changed that into a dark room. So I learned a bit about chemicals right back then and for some reason said I was going to be a scientist.

So were any other people in your family interested in science? Or were you a loner in that?

I was really. My dad was thrilled with this idea, I suppose. He encouraged me – so did mum. [They] bought me books. It's just something that I wanted to do.

In Fintona in the 1940s, did they have good laboratory facilities at school to do science?

No. At the junior school, you didn't do science as a separate subject. And unfortunately, we had some good teachers going through, but in secondary school, there were only three of us that did physics and two did chemistry in year 12 and we had a good young chemistry teacher. She was good. But the physics teacher hadn't taught for 18 years and it was terrible. She couldn't set up equipment. I'd take equipment home and set up my experiment at home. And that was probably a good thing but it's very different now.

So was the chemistry teacher... she was a younger teacher...

She was younger graduate and she had just graduated...

Had she been in the war or had she...

Oh no. She was just a new graduate. So chemistry was good and physics was a challenge.

But you did well enough to get to go to university?

That's right.

So did you set up chemistry experiments... you'd obviously done some chemistry because you'd developed photographs...

Yeah but then I'd gone on from that and got a chemistry set. I was the only one interested and I just would set up and do it and I knew. You know, I don't know why it was, but when I was in secondary school again Fintona but we moved site, my parents went overseas and said "What do you want us to bring back?" and I said "A microscope" and it just happened they were on a plane from Canada to England and they met Charles Best who discovered insulin and they were chatting on the plane and found out what he did and they said "Oh, our daughter wants a microscope, where do we get one?" And he told them somewhere to go in London. I've got this beautiful old microscope that my children wouldn't...

Have you still got it?

Yes, I've still got it but my children find the microscope... the microscopes are much easier [today]. It was so hard to focus but I persevered with that. So I had that...

Yes. You can get it on your mobile phone almost...

That's right!

So what about mathematics?

I was very good at.

And was that well taught?

And that was well taught at Fintona, and I did very well in that so...

At the University of Melbourne

So you went to become interested in science and you went to Melbourne University.

Yes.

What did you do there?

I was in women's college it was called, not university college, and I think that's a great thing. We then sent our kids to college when they went to university. That was a good life. And so I started off with the normal chemistry, zoology, physics, maths and the zoology I loved and it was doing zoology I realised that I heard about biochemistry and I decided then I wanted to do.

So who was the zoology teacher who interested you in zoology. Do you remember?

There was a new American professor that came 'White' I think he was called but it wasn't him... it was just the subject. I think that's where I was really interested in life and learning about it and I learned about that.

So first year you did just zoology, chemistry, physics and maths. Second year you did...

Chemistry, biochemistry and then...

You didn't continue with zoology?

No. I wanted to not go on with zoology so much. I really didn't like killing rats or even dissecting rats. When we had our first 'prac' in zoology and I looked at that rat and I said if you want to do this you've got to cut up that rat!

I remember that.

Yes and in physiology killing those rats was terrible...

So in second year you did physiology?

Yes, chemistry, physiology, biochemistry...

And chemistry

Yes

And third year?

Just chemistry and biochemistry.

Was Professor Trikojus..?

Trikojus, yes.

Professor Trikojus

Yeah he was great and I got the exhibition in biochemistry in third year and he asked me to be his Master's student. And so, I worked on his passion which was thyroid enzymes and that was really good working for him then.

Master's degree at Melbourne

So in Melbourne University at that time, you went straight from a BSc to a Masters?

Yes.

You didn't do honours?

No

Okay. Why was that?

I don't think there was a big enough number of people wanting to do honours so you went straight into the Masters and I had enough results and the Prof said to me "You know you've got enough here for a PhD. If you had one more year you could get a PhD". But by that time, I was engaged to Rob and we were wanting to go overseas at the end of my Masters. So I wrote it up as a Master's thesis. It was really good working on thyroid enzymes.

And you published that I think...?

It was published.

With - how to pronounce his name?

Trikojus. 'Trick' as they called him. Victor Trikojus. He was great.

You remember Sefton Hayman, I suppose, do you? Sefton Hamann - the Chief of the Division of Applied Chemistry. He was a great friend of Trikojus

I don't remember him really. But you know I'd go in weekends and professor had one of the houses on campus and so he'd come over and chat to me if I was there. That was really good.

So the Women's College was on that college road?

Yes - opposite Ormond College. So it was on the triangle of Royal Parade.

Surrounded by traffic these days...

That's right of course and is it still the women's college? No, it's now called University College because it takes men as well.

Okay. Can I just ask about your interest in science at that stage of your life. Doing your Master's you've got you're mixing with the senior people in the university at professor level. Is your mind at that point, geared into what I'd call science at the graduate, postgraduate level. In other words

thinking about heading towards the forefronts of science and what's happening in the world, as opposed to mastering the textbook stuff.

Yes. I can remember a lecture when Jack Legge our lecturer came in and he was just so excited and he started the lecturer saying "It's just amazing they found all of our proteins and DNA" and he told us about DNA and then we all read about it. So that was a very exciting time to be doing biochemistry.

When you did biochemistry at the University of Melbourne, were there other women in the class or were you...

There were some. The best thing for me was Adrienne Clarke was doing her Master's when I started doing...or she was doing her PhD when Muff McLeod...the two of them and so I became very friendly with both of us them and Bruce Stone I got to know well through that. Frank Hird was good...

They were students or?

No Adrienne was there doing her PhD under Bruce Stone at the time and Muff McLeod was working with Jack Legge - doing her PhD at the time.

When I did 'Chemistry Three' at the University of Western Australia, there were only there were 20 males and one female so in chemistry, were you were a lone female or...?

'Chemistry One' they had a tutorial and they obviously put you into these tutorials on your Year 12 results, 'matric' results and I was put in this tutorial I was the one girl and there were 100s of men and one of them would come and sit next to me at this Friday afternoon tutorial. But then, later on, there were always some women but it was really good having Adrienne and Muff in biochemistry while I was doing my Master's...

Were the academics mainly male? Were there any females?

Although I was working under Prof Trick, Mary McQuillan was my direct supervisor so and there was another one. And in my first year of doing my masters Adrienne and Muff and the other woman and I went up to a conference; a biochemistry conference in Brisbane and that was a good experience for me to be with these people for that time...

And so did you perceive any discrimination against you because you were female?

None at all and you know the fact that the Prof wanted me to work through and encouraged me was good but I didn't have any [inaudible].

Thanks. Very good. So you mentioned earlier that you finished your Master's degree and it possibly should have been...you should have written it up as a PhD and then you went to England.

Yes

With Rob?

Yes.

Working at University College London

Did you work in England?

I did. I had to support him. He was studying.

What was he doing?

He had started teaching without a DipEd and he wanted to get a DipEd so he went over and did a DipEd which was...

At where?

University College (London) and that was a really good experience for him but I went over and Professor Trikojus just had given me some names and we had planned to establish ourselves in London and getting somewhere to live for the year and we got the Nuffield Flats there which was really good we're in then so we had one day of everything falling into place and I went and saw Professor Eric Crook.

Professor Crook?

Yeah Crook.

At UCL?

He was at St Bart's. He was doing work with others but he was Professor at St Bartholomew's Hospital Medical College and I said "I've just been told to come and see you" and he said "Well look, I've got one job" and it was on immobilised enzymes and I said "That sounds interesting with my work" and he offered me the job and told me how much he pays. He said "It's not it's not very good and there is a job going over the school" of the actual hospital, at St. Bart's Hospital and he sent me over to see a professor there who also offered me a job with more money but I came back and I said "No. I'm more interested in your work." and we went off to the continent for six weeks after this. When I came back he said "I've managed to match the money" and so I had it and the money was a bit important because I was supporting Rob so but then I had very good time. And again, I would have done a PhD there, but my mother was dying of cancer.

So when you say you would have done a PhD there, had you enrolled in a PhD or not?

I hadn't but I was going to in the second year that I was there but I was working with other PhD students and I was going to do that and anyway I'm very glad we did decide to come home. So we came home and I had some good months with mum before she died.

So were you in England for one year?

Over a year.

And Rob got his DipEd?

He got his DipEd and then he taught another year so it was we arrived in July I think, and I thought it would have been the following year we left in September.

Back to Melbourne and a position with CSIRO

So you came back to Australia when? July? Which year roughly, sorry?

[inaudible]

Is your CV here?

'66 I started at CSIRO. So we came back in '65.

Yeah, that right. You started CSIRO in 1966 after the...towards the end of 1966. after the equal pay decision had been made or the married women decision has been made. So before 1966 married women couldn't work for the Commonwealth or...

But I got in just after that. So the end of 1966...

That's right but really I had longer and we got there in '63 and left in '65. So I had that extra time and so I had a

And so Rob taught in England as well?

Yes so he did a year of studying and a year teaching and then we came back after that.

And what does Rob teach?

Maths. He actually did science originally but then [inaudible]...as a maths teacher...

So when you came back from England you didn't work immediately...

No. I actually wrote up the work that I've been doing for Professor Crook and said...

For publication?

I didn't write it as a paper. He put it in with some others as a paper and but he had said I could continue with the work as a PhD if I could get someone here. And I went up to Melbourne University and asked Frank Hird and he said "I've never had a female student before". He wasn't too keen and then Bruce Stone was away and I wrote to him and on Friday the 18th of December, I got a letter from Bruce saying he wasn't happy to take me on on that topic and spend time on the topic I was working on. I could start on a new topic and I thought I'm not going to start another PhD.

So I had a friend at CSIRO and rang him up and said do you know if I could get a job at CSIRO and this was the Friday - nearly last week in December 18th of December he said come up and meet Gordon Lennox and I did and Gordon Lennox was just wonderful. He was wonderful to me the whole time through and he said "look, the only job I've got is first of all you've got to find out about improving hide and skin qualities and you'd have to go to meat works and I said "What's wrong with that?" and he took me up to the leather section and I was interested and he said he said to me later he knew I was interested. I was touching the leather and he offered me a job that had been advertised for a PhD (or equivalent) and he offered it to me then. I didn't have any interview.

So who was your friend?

John Yates.

Oh, John Yates. We know John Yates very well.

He was in Ormond [College] with my husband at the same time. So we knew him then. So, I fell into this whole area...

So you joined CSIRO as an Experimental Officer?

Yes.

Was the job that they were advertising for a PhD or a research scientist job?

Yes and he was upset that they took it back to an Experimental Officer but he said he couldn't do anything about that. And then, you know, I had to stay as Experimental Officer for so long.

Was that the Division of Protein Chemistry?

Yes – it was Protein Chemistry there at 343 Royal Parade. It was a fabulous division. He just knew everybody and it was wonderful and so good to me because I started on this job and had to go and visit meat works around Australia to see what they were doing with hides and skins because the tanners had put in money to do research at our Division and they said the main thing for them was improving the quality of hides and skins. And they felt it was the preservation - and so I had to look at the preservation. So, I had to go around to meat works and that's where people were surprised with me going to meat works.

They stunk.

One didn't reply in Townsville when I wrote to try and get an appointment. When I got up there, I hadn't heard from him, so I rang him and he said "Yes - I could go". And he said 'Oh - that's Mrs Money - I didn't think she'd look like you" and he showed me around the meat works and he said look "I've got to tell you that you won't like my calendars that around" and I said "I can cope" so that's the sort of thing I did have. But in the end, I think they all saw that... I was lucky. I came into something where I could see you could have changes. And so instead of salting hides, we looked at alternatives.

Can we just go back before we start on that leather work. So your job in...your master's degree in biochemistry at Melbourne. [It] was about enzyme actions, wasn't it?

Yes.

So when you went to London, your job was very much closely connected to the work that you'd done with Trikojus?

Yes - so I stayed on enzymes...

And if you'd kept going with a PhD in London or in Melbourne, that would have been on enzymes. But you decided...so your first job was actually related to your academic training. The second job you had in CSIRO was not really connected to enzymes or were you were able to use that knowledge of enzymes in that work?

I was because there's one process in the tanning industry that's called *bating* and they did have enzymes for bating when I came along. Before that they'd used dog dung to get enzymes to soften the hide and that's what the bating was. And so it was there, but also in the work we came up with something that was happening getting hair losing. This is where Gordon Lennox suggested to me that it could be lysosomal enzymes. And we did do work trying to get that as a process - the enzymes within the hide that's released - try and use them and you can loosen the hair, but you couldn't get it good enough. So, I did spend time working on enzymes. Then later enzyme unhairing came in and used adding enzymes from the unhairing...

Can I just go back now. So can you fill us in on the hides and leather. When Ian Wark set up the Division of Industrial Chemistry, hides and leather was one of the projects that was in 1939...

Was it? Oh yes well Gordon Lennox had worked on fellmongering.

Yes. So was Gordon Lennox one of the original... he was involved in from CSIRO in the during the war?

Yes.

So he was part of the Division of Industrial Chemistry that Ian Wark set up and he was in charge of hides and leather. So he personally was very interested in your project.

And very interested all the time that was going on with something and actually later we did some work on fellmongering but that's now I've got some books that he wrote about fellmongering in the '40s...

So can you tell us what fellmongering is?

Fellmongering is a recovery of wool from the skin. And so they can use the wool and it's normal wool and you can use the skin. Because at the time I came into the industry there weren't very many sheepskins being tanned with the wool on and that became a big thing but... there were some but there was also fellmongering going on in some places but it had died out really. France took over fellmongering Australian skins and the dried sheepskins were sent to Mazamet in France and the whole town of Mazamet was established around recovering the wool and then processing the skin into a suede to chamois leather. They made chamois leather out of the skins and that had died out in Australia which had been a big industry here. We tried to re-establish it but we didn't...

So in 1948, the Australian Leather Research Association was formed. The Australian Leather Industry established the Australian Leather Research Association. It's a legal form so that was a research association that in 1948. Did that fund some of the research that was going on in the division?

In the end that closed down. They were in Sydney and then that was closing down at the time that the tanners approached Gordon Lennox about starting up in Parkville.

So they had research in some other... not in CSIR?

Yeah, that's right.

They had they had their own research but then they closed that down?

Yeah

So, do you know why that association failed?

No I don't really. Because when I came into it, the tanners were really keen and keen to help and keen to have you go and visit, because I knew nothing about it. And I started in January and they had a meeting at the end of January when I had just started and so I met a lot of the tanners and I became friends with so many people through the industry.

Can we just get back to this Leather Association and this is in the CSIRO Annual Report, "under powers given to it by the Act, the council is supporting the association" so for providing a grant at the rate of a dollar for a dollar for all money spent by the Association on scientific research up to a maximum of 5000 pounds per annum. The Council for Scientific Industrial Research has two representatives on the Council of the Association. So was that work done in Melbourne or by Gordon Lennox still? In 1948?

In 1948. No that was separate and then but it was the same group that came to Gordon and started up again with a similar thing of money that the Commonwealth put in some money, but the tanners put in I think half...

Since 1965 research for the Australian hides, skin and leather industry has been carried out almost exclusively by the Leather Industry Research Association based at the Division of Protein Chemistry. So you came into that post-1965 which was the Leather Industry Research Association so after that

1948 thing had gone, this new one the leather 1965 the Leather Industry Research Association started and they gave money to you.

Yes and we had a committee set up of on starting on research projects and the important ones. This is why I started working on preservation. That's what they wanted as high priority then they started working on other tanning agents as well and there was working expanded but always there was a committee with the tanners involved - or not always - until they stopped funding it and then that changed...

So when did that fall over?

No that was '65. I started work in '66.

Okay so you were lucky. You were right on the transition of being able to employ married women

Yes, it was great but it still wasn't equal pay for women as we'll get to this whole thing of working part-time...

So you started working in January of 1966 and what were you... how long did you work before you started having children?

I had the first child in 1968.

Okay you worked there for a couple of years and you'd established yourself as Experimental Officer.

That's right

Were there other scientists. Was Scroggie...?

Yeah Jim Scroggie...

Was he a scientist working in leather?

Research Scientist. Yes.

So was he your sort of supervisor or did you work independently?

We worked quite a bit together on things on this lysosome hairing. I worked with him but we worked quite closely. We were a small group and our projects had to be approved by the tanners who were supporting him so... and we had a meeting of all tanners from Australia that could come to once a year but there was a committee...

So when you say the tanners, this was the Leather Industry Research Association?

Yeah

It says here that they were based at the Division of Protein Chemistry. So did they have an office?

No they didn't but we had meetings there. Once a year we had a full meeting where we described all our work and what had been done. But we had close relationships. I did projects with different tanneries and visited tanneries all around Australia.

I was just going to ask you that. So these tanneries were in all states, were they?

Yes.

So you had to visit. So [in] 1966, how did you do that? Did you fly around?

Yes, I flew around. In fact, Gordon Lennox said to me “Just pick some meat works...” and I said “For Western Australia, can I pick Albany?” because my sister lived there. And he said “Yes”. I was so surprised. So they paid my airfare to go down to Albany. But it was good to see that works and there was a small tannery there.

There was.

So I just had to go and see what was happening. But then everybody was hand salting hides and they called *bibling* it. They folded it up and it was a pack with the hair on the outside and the salt in the middle...

So the leather industry in 1966, were you the only female around?

Research for the leather industry

Yes.

When you were visiting plants, it was basically a male industry?

It was. But look, I found so quickly that I was a good problem solver for the tannery. And I'd go out... there were a lot of tanneries in Richmond. There was one that I went to and I knew nothing about really what they were doing. I was learning at the same time. Mayall's tannery, they were doing sheepskin. And they had this problem that they were getting separation of the skin. And I said “Well let's go through the process” and then at the end of that I said now what are you doing differently now and they thought back and they said we've changed the setting on the machine. And just from my general knowledge, I said well the pressure will be different and so I solved that problem. They only had to change...and I found that often. You only need someone to say what are you doing differently and then to go through the different processes. So that served me well.

So you had to only change one variable at a time

Yes and that was something you learnt very quickly.

So the first couple of years you were working full time and then you start having children and what happened then?

Perhaps we should go back to what I worked on because in going out and seeing hide preservation I just thought there must be an alternative to salting and I started working on chemical short-term preservation. and we developed a process using Imprapel. I tried lots of different biocides. Imprapel sodium chlorite, the active ingredient in Napisan so now everyone's using it or chilling for short term preservation. We got that into Pitt's tannery in Northcote very quickly...

So what did the biocide do?

It stops the growth of any bacteria. The salt dehydrates the hide and saturates any moisture and preserves that way. So we were looking at something that's short-term preservation. So for people who were getting hides, rather than salting them and preserving for a long time if they didn't need it, they could use this. At first we were looking for up to a week that they could hold hides and sort them later. Sodium chlorite is still in use now. And it's still helping tanneries take hides from Queensland into northern New South Wales overnight. They do it in big mixers and take it overnight. And then it's preserved so it can go into work without getting deterioration of the grain layer particularly...

And was that method adopted internationally?

Yes. In fact...I found it being used in Brazil and they got it because I published it and they got it from that and they did what I suggested they could do: put it in their mixers and they had mixers going around Brazil picking up hides over a thousand miles and preserving it and taking them to the tanneries. So, they went on and used it from that. We didn't have that set up with the mixers taking it till later, but now it's still being used. So, in Queensland, the hides are going into mixes going down to Melbourne and northern New South Wales.

So if you were in CSIRO today, would that process have been patented? You published it and it was adopted in Australia around the world and CSIRO got no royalties.

That's right. It would have been difficult to get royalties.

Would that have been a patentable process?

They might have tried to do it but the idea was people had looked at different biocides to soak hides in. But they hadn't called the short-term preservation type of thing so that's what we were looking at. And yes, you might have tried to patent it but you know spend ages doing it this way it was just...

So the philosophy of your group was that you were there to assist the hides and leather industry - not make money for CSIRO?

That's right and that's what I felt the whole way through. It just curtailed this later on when we had to try and make money. But we did at the same time as going to short-term preservation that was the first thing we got into industry. But we did look at improving the salting and different salt additives to add to the salt and they're still used with sheep skin.

Can I ask you...you say hides in Queensland. So, are we talking about hides of cows, as well as sheep?

Mainly cow is what I worked on and the sheep you don't use this liquid mixing because you try and keep the wool dry. So, with the sheepskin, we went to chilling and drum salting. But we've got no sheepskin tanning industry in Australia anymore. It's just devastating. You know, when I started, you'd go out to Richmond and there were tanneries all along Yarra Street and Mayalls I worked with a lot. So they started off this system of chilling sheepskins. Not Mayalls so much. They did other things we initiated. But chilling of sheepskins became an important thing.

Catherine, I just wanted to interrupt and just talk about the industry as it was at that time. The kind of method that you had for working with the industry works very well with agricultural industries where farmer growing wheat is not competing with the farmer growing wheat next door. They're competing with international wheat growers and things like that and so an industry as a whole is interested in improving the efficiency of the technology used in their whole industry. If you go to manufacturing very often the guy next door is your competitor and you want an advantage over that competitor and you do not want to be sharing you know the best practice did that evolve in Australia in other words you were able to work with the tanning industries as though they were competing with someone else overseas or whatever, and they were interested in new technologies that worked better and improved efficiency for the whole industry and they would not necessarily trying to confine that just to their firm, as opposed to the industry as a whole. Is that a proper representation of what was happening back then?

It was. There were some that didn't want to share information, but we had a wonderful tanner, Colin Chaffer, and they had a tannery in Sydney but he was the first to go - well he actually wasn't - the first. There was one in 1970 when they started up. They had a meat works and they started up a tannery, a wet 'blue tannery' again using our processes because nobody did what we call 'green

processing'. You always salted it. So once they knew you didn't have to salt, hides could go straight to tanning. You didn't need to remove that blood and all the things they change. So that started and then Colin, he started up 'Walfertan' and with the meat works Walkers. When he got that going he said to all the tanners you can come up and have a look and that was terrific. Now some of the tanners said "well I wouldn't do that" but he did and the only tanneries that are viable now are those that have gone to the country, can get their hides locally and the only way to treat effluents is to put it onto land. Everything there, you keep the chrome out, and recycle that and everything else can go on the land.. So now they've got farmers employed. Before sometimes they would do it on the land but now they buy up farms as well and run farms ... They irrigate with the effluent and have to be very careful that they don't get any odours because you've got sulphur there from the sulphide and unhairing so you've got to keep it all oxidized and then wash out the irrigation pipes...They have solar irrigators and they can irrigate huge areas of the land and they're selling hay.

And in terms of working with an industry, so you're in CSIRO you want to work with an industry you need to know what's going on you need to have access you need to have communication preferably even collaboration on experiments and so forth. The tanning industry back in the late 60s, early 70s was amenable to that sort of thing and it changed, is that correct?

According to the annual report, the Leather Industry Research Association started in 1965 and all the characteristics that Terry was talking about. So it presumably had most of the big players and many of the small players were involved in this. And so they helped set the research agenda, did they?

Yes.

So you told them what the problems were in some ways and then they agreed and they told you some problems so there was a two ways.....

And we didn't have to ask them. When I came back and said "We'll we need short-term preservation." I didn't go to them but then when we next have a meeting, we'd say well we've started on this and there's the results and then they'd do trials. So Pitts did trials for short-term preservation...

Yes. I think that's an interesting point because it says here that this expenditure that they gave CSIRO about 280 thousand - a hundred thousand dollars is provided by the tanning industry. So the annual report says this is very less than 0.1% of the value of the raw commodity which is considerably less than for any other primary product. But in the way that we count research these days, you're saying that was a considerable amount of 'in-kind' contribution by the industry because they tested your processes and can you elaborate [on] that a bit.

Well Chaffers were one. If I said "I think this is worth trying". They'd do it even though they might lose hides. Victorian Hides and Skins Processors, VHSP, - a big tannery down in the Footscray area - they built it. They put in tanning drums and when Jim Scroggie left, I took over the 'unhairing' process which we called 'Sirolime' and I had to get that into industry. We'd done trials. The trouble is, we'd done all our trials on chilled hides (or frozen hides) and you got the hair a bit loose. The freezing loosened the hair a bit. When we went to do it in industry in a drum of fresh hides, it didn't work. So, we had to change the process.

So when you say when you went to industry, was it you that went?

Yeah

And people from the company were involved in that next stage the sort of pilot plants?

And this started right back when I put in short-term preservation. They said yes they'll do trials and we went out and did trials in industry.

So one of the flavours of the month politically is collaboration the government's beating the drum and universities like this one and all the others are being flogged into trying to increase the level of collaboration. What you're talking about is I think precisely what the government wants however it's very hard when you've got industries that are not interested in cooperating and collaborating...

Well at least in our industry and perhaps it's the way it started off with them coming to CSIRO and having an association that...because later they just didn't go ahead with it and I was so upset.

Well we will come back to that...

I would love to ask this question. Do you know why they made that decision?

That decision what was, in 1990?

But this key decision, on the behalf of industry, to cease working that way, must have had some motivating factors.

They must have thought it wasn't then giving them enough advantage. But when you think...

As against each other or as against overseas competitors?

I'll have to think about it more because, let me tell you one thing, with this Colin Chaffer. When he set up and asked everyone everything was good.

Can we just... Colin Chaffer? C-H-A-F-F-E-R?

F-F-E-R.

He was an owner of a tannery?

It was a family tannery and at the time of our Congress, he was head of the Leather Industry Association and we worked closely with him and he they put up money for the congress and they thought it was terrific. But I think there were others who didn't want to share their information as he would...

Is it the case...I'm just asking this question...were the in the early days when you started were all the tanneries like the Chaffer one locally owned, Australian-owned tanneries but family companies and so on, was there a time when larger corporations bought tanneries or is the ownership of tanneries is always small companies? So you can imagine that if a small Australian company was doing research and even in Australia they were competing with a multinational company that had tanneries in other countries, they'd be less inclined to share than if they were sharing with a range of other family locally owned countries. Did the ownership of the industry change during that time? Do you know?

I don't think it did markedly Michaelis Hallenstein [Tannery] at Footscray was one we worked closely with and they joined with Baileys and then I'm not sure what happened to them in the end but then they were very supportive too and we did trials with them. It was still a good working environment for tanneries and CSIRO when John Menzies was there in 1990 - when they decided not to go ahead. I thought it was still working but I'll have to think. There were some bigger companies. Michell took over. There was tannery...

Was Michell a local company or...?

Yeah it was mainly in South Australia and they had wool and they had a wool scourer but they had a small tannery and then they built [a] bigger tannery and one of these ones there's one at Culcairn now that's owned by Geelong Leather.

So, there's two potential motivations that I can think of for winding it up. One of them is that they didn't want to be in this sharing environment. They wanted to be, you know, out-compete their local competitors. Another reason might have been that they simply did not want to contribute money to that joint fund.

I think that that we had done so much to improve the industry and the processes had been adopted. There were no obvious big projects for them to support.

Even though it was peanuts compared to the size of the industry?

Well we developed all these recycling methods and you recycled the chrome tanning liquor the first and that's still now it's just around the world. And then Jim had done the work on the chrome and I did it on the unhairing liquors that she could recycle those liquors so we had recycling going and this 'siroliming' was a new way of getting the hair out of the drum that you actually take the hair off you immunise it slightly by without the alkaline treatment so it doesn't break down as quickly when you add the sulphide. So we were at a stage that...what did I say then...I'm thinking of Toppers but it was it'll come to me and they were setting up and they had all these big drums they'd put it out at Footscray and I said "Look, we've got a problem with this that it's large scale we're not getting the hair off" and then we worked on different things and got it improved. We had to change the amount of sulphide you added and went and I said "We could do a small scale trial out there" and he said no we've got the big drums already they put in these big drums that then you could take all the liquor out, filter out the hair and put it back in and he said we'll do it and we got it working and then that went everywhere and that's used around the world now too. The thing is, once you do something like that there's some ways you can get money back from doing it and...

That's from CSIRO's point of view but I'm thinking still about the industry. Where are we if they're worried about these small amounts of money and that's enough to put an end to the practice, was there a movement happening within the industry which we would these days call 'cost reduction' - in other words there is so much pressure from the customers of the tanners to get prices down, that they shave off any discretionary expenditure and that includes spending money on research and research associations.

I must say, I didn't even think of that at that time. I felt John Menzies could have changed it at the time. We perhaps have to talk to him. He perhaps didn't like things as they were happening in CSIRO.

So he was very influential and could have actually changed the decision.

He was president or chair or whatever he was the one that announced it that they weren't going to work closely with it.

And that decision might have been made by him privately in his own office and then announced?

He would then talk to others. No he would have talked to others and they may have also thought that we'd come up with most things we were able to that were important and that was true we did all the ones that were doable and it was very hard to find things that were going to have the same impact.

You were running out of problems that were open to in effect scientific solutions. Is that fair?

Yes a lot of it was them controlling the systems that that we had come up with and putting in better drums and by this time the Italians had started making better drums. Tanners are now putting in even better drums. I .. Tanners are still brining hides and exporting with salt and getting problems, I said "We shouldn't be selling any salted hides, they should all go away tanned" and then all the nutrients go on the land in Australia and it's brilliant.. You keep the salt out, the salt's the one thing you can't have for irrigation. You keep the chrome, you recycle that, but the hair is a slow release fertilizer itself and is good for land application. I can show you photos of just how good the crops are that they're now taking off and these tanners are all buying up more land

To use your sort of technology?

Yeah.

So Catherine we've been going for an hour and a half we probably ought to have a break. So i'll pause this now

[LUNCH/COFFEE BREAK]

Starting a family; continuing a research career

So thank you Catherine. That was a good break. So we'll go back to 1967 when you start having children.

'68 was the first one.

Okay so what happened? What would have been the normal thing when somebody at CSIRO - a lady at CSIRO had start to have a family what would have happened to them?

I just assumed because there weren't other women at Parkville, I just assumed I wouldn't be able to work part-time so I went and saw Gordon [Lennox] and says that I was pregnant and would have to leave and he said "Oh no - you don't have to leave. We'll be able to organise something" and so I didn't sign any forms and I was very lucky. I had a mother-in-law in Geelong and if I rang her before seven, she'd be up by nine.

So did you work full time?

I didn't I didn't go back to full time until I was...

Okay so when I've looked up the annual reports, you were listed as on the staff of the Division of Protein Chemistry until 1968 and then not again for a while. Did you get paid?

I got paid and I can't work out how they did it. It didn't worry me very much: I knew I was getting something but I knew by the time I had three children it was costing me more for them to go to creche than I was earning, but it was worth doing. And so that didn't worry me much. I just told people what time, you know what hours I worked and that wasn't an issue for me.

In the beginning, did you work, what a day a week or two days a week?

Two half days

Okay let me just get this timing. So you became pregnant and you said you stayed at work until the baby was born and then you took some time off before you went back?

Two weeks. I thought I'd take longer because then I just went back half a day - well two half days a week. My mother-in-law would come down and I'd go to work. It was just because Udo was still

working full-time on the project, I just felt it was good to keep in touch. I didn't have to and Gordon just said "Well just record what hours you worked."

So this Udo...

Udo Adminis. He came out to Clayton...

So, he was your technical assistant?

Technical assistant.

So was he working just with you or did he also work with Jim Scroggie?

He worked just with me initially you know I was the one that interviewed him and appointed him some years before that when I first got an assistant.

So, he was working full time and you came you essentially was supervising his work

I'd ring him every day and Gordon Lennox said to me when I said oh yeah can I do this and he said I know that when you're feeding that baby you'll be thinking of work and he just had confidence in me then and so I was and I kept that going...

So after two weeks of looking after the child, you got back to work two half days a week. And how long did the two half days a week go?

I can't really remember but I gradually... as I felt I could do more, I did more and I got back to several days a week because then there was a creche. The Melbourne University Family Club...

Okay well can I just get this. So [in] 1968 David was born and so for 1968 then you worked part-time?

Yeah

In 1969 you had two children.

Two children by 1970.

So when was the second one born?

[inaudible] 1970, the 3rd (called Gordon) in 1971

October '72 so in '69 uh did you still working part-time?

Yes but I probably I can't remember what I was back at then but I went back once he went to creche I went back probably four days

Melbourne University creche: work-life balance established

So a crèche developed at Melbourne University?

Yes it was been started before I had David and then I joined it and I got on the committee and I was involved in staff appointments my responsibility but there was a guy Jack Best who started this off with someone else. Anyway I was right from the start on that committee and we found different premises and they worked with I didn't do anything about the funding but we moved and the creche is still there. But I was able to change my days there as it suited me. I had to formalise it so you'd have which three days of the week I got back each time...

The three days a week that you were working and then Gordon Lennox allowed you to choose those three to say so eventually went back to three days a week.

And then I got back to four days a week. But I didn't go back to five days a week until Gordon left school.

Okay. Left secondary school?

Left secondary school. Because then I got on the primary school council then I was president of John Gardiner [High School] council and I kept Mondays for my out of CSIRO activities and didn't go back full time until Gordon left school. So I was pretty lucky.

So you sort of had the work-life balance was in a sense organised between you and the chief.

Yeah

And this was in a sense I get because Gordon Lennox was very confident that you would actually that he needed you to operate this interactions between the industry and CSIRO.

Yes.

So did Jim Scroggie go around to the companies, or were you the main interactor between CSIRO and the companies?

Oh Jim did too. But I probably did more problem solving and I travelled interstate more even when I had children I'd travel interstate and Rob was terrific. He was teaching so that was good he could fit in things and be home: he was always be home on Thursday afternoons and in time for after school so and school holidays you see was good I didn't because he had school holidays so it was perfect having a teacher as a husband.

And Catherine when you went to visit various tanneries, did you always go for free in other words you didn't charge them for your time there?

We didn't charge them initially but then later on we did and...

And can you remember roughly what time that would have made that transition? You were back full time in 1990. Would it have been around then?

Yes – I'm trying to think when we had to start charging. I really can't. Sometimes if it was to do with our research. We didn't charge them because we were doing trials in a tannery and they were contributing and paying for it all. So we only started charging when we were doing more consulting and coming in to help them solve problems at their request

And was that all formalized and you know full rates and at a competitive rate for consultants?

It just shows even though I was in charge of the group at the end we had a charging daily rate that that we charged and sometimes we quote for things.

Have you heard of the concept of 'competitive neutrality'?

I've heard of it but I haven't ever actually practiced I don't think but we had we had a good business arrangement that if it was going to solve a problem, just for one tannery, they would pay a consulting fee and we had a consulting fee.

And did that cause any difference in the rate at which your services were called upon?

No - not really people still wanted us to go and they would pay. And we started charging for say if we were doing testing in the lab we would have a rate for doing work in the lab for trials. It was really my assistant that worked out though and the industry didn't ever complain and we had a good two-way relationship that we learned at the same time. You know when you went in to put in a new process always things went wrong and you had to come back and do some trials and work out what...

CSIRO and industrial research

So going back to the discussion we had a little while ago about why the research association was wound up and we wondered whether that was because of the cost. The industry can pay, does pay or did pay yeah so that probably was not the real cause.

No it was probably that it wasn't the uniform thing that some we worked more with some than the others I don't know but that was 1990 that that changed. So we went till 1990 without that and then we had the system and it worked right up until when I left that we were still doing this if we had charges and charges for doing lab testing.

So in the Division of Protein Chemistry, when you were there, you say you were one of the few women scientists there at that time or other technical assistants and other females at Parkville but you were one of the more seniors...

Yeah but then we had Margaret Davis came into our leather group and she had a similar arrangement to me that she had children and she worked part-time. And there were some other women in the that came full-time in the wool area and then later on in the protein chemistry area.

So can I ask you about measures of merit. So you started off as an Experimental Officer. Clearly from your description of what you're doing - that you were employed as an Experimental Officer but working as a research scientist, but it was a while before you were transferred from the Experimental Officer [pay] scale to the research scientist [pay] scale.

Yes longer than I think it should have been but I didn't worry because I was treated the way I was I didn't want to push it. I felt it was good but while I was still at Parkville it worked well and actually when we moved, it was just accepted that they trusted me to say what hours I worked so...

When you look at your academic your publication report or something you clearly writing papers wasn't the major part of your activity.

No so I wasn't very good at writing papers...

But that was not because you're a female. That was because you were more interested in solving the problems than writing the paper...

And I wanted to get the processes working yes in industry that was my ---- what really was my aim to get improve the processes and get them into industry.

Do you think that that affected your promotion do you think if you'd actually not worked for industry as much and wrote more papers you would have got...

I think I would have yes.

But you didn't!. You pursued your interests?

I did and it wasn't until Peter Gordon was in charge and I wasn't working Mondays. Then I found out what I'd go to work most Mondays but I wanted to have that freedom and then I said well you know "Now I will work Mondays" and go back and that's when I got into the system again.

So Peter Gordon. When did Peter...I remember Peter Gordon. So when did he come? Did Jim Scroggie retire?

Yes but that was in '87 at the end of our congress that year and Neil Evans was Chief for a while and I thought well I'm doing what I like. And there was one thing when I was asked to go to China and they were paying everything and he said that he thought that could wait and I said "Oh they're paying everything and I'd like to go" and I went and that was important to me because they paid for everything once I got there. And I really enjoyed going to different countries and being able to make great friends and to implement our processes. So that was what my interest was more and then when it came to this stage of...I said to Peter "now I'd like to work on Mondays and be paid"...well be paid for Mondays because I was working Mondays.

But you eventually became in charge of the Leather Research Centre?

Yes.

When Peter Gordon retired?

Yes.

Promotion to Senior Principal Research Scientist

When were you promoted to Scientist?

Before that, yes.

And you became Senior Principal...

Yeah

So you went straight from Experimental Officer to Senior Principal Research Scientist?

That's right.

OK.

And that's because I didn't want to make a fuss about it earlier. I was happy with what was happening. But I know when it came up they said oh you know you could go onto that level [inaudible] as a Senior Principal Research Scientist...

And you retired as a Senior Principal Research Scientist?

Yes.

OK...so...

So Tom, do you mind if I just ask...Head Office...The personnel department of Head Office used to be intimately involved in every promotion and were seen as the devils by people in divisions. By the time that you were making that transition, was that an important factor? In other words, the division was saying to you "Well we're going to try and get you up but it's going to be a battle to get it past the Head Office HR team"...

Yes. It probably was much the same.

So you had to make out a case?

I had to make out a case and the case was all the money I got in on projects.

Right:

It was an enormous amount of money I had got in for different projects and not all the things that I'd done. It was easy to get it through but we still had to write the case.

It probably could have been done a lot earlier.

Yes, it could.

But not on publications

No.

You know I very clearly recollect they were very keen on publications.

That's right. And you see I didn't want to take the time. I wrote up reports but not full publications and so I got it on the industry side of things

Yes on the business side of things...

Role of mentors

So Gordon Lennox was really a great mentor to you.

Yes, he was.

Did you have other mentors? I recall you saying earlier that when you're at university you're very happy to have Adrienne Clarke and Muff McCloud - Margaret McCloud. Senior students in your where you're working. Did you have other mentors on the way?

Well Jim Scroggie and I worked successfully together. [inaudible]...For me protein chemistry was wonderful there was Ian O'Donnell and Mike Jerman and they were wonderful mentors to me because they accepted that I was doing interesting things and we'd talk about everything in life and Gordon Crewther never the same. So Ian O'Donnell had a big influence on me.

So Ian O'Donnell was one of your mentors too?

Yes, he was and he supported me you know three of us I think people thought it was strange you know two more senior men but we discussed religion and ethics and all sorts of things. So they were very important to me but and they're both interesting people.

Very interesting people and Ian O'Donnell himself was a very interesting guy.

Wonderful yeah just so sad. He influenced me a lot and he just I went to a conference early on on proteins but at that conference he just helped me along and meeting people.

Can I just continue this Gordon Lennox, Gordon Crewther? Gordon Lennox from what you're saying was very interested in CSIR/CSIRO contributing to the industry and not as concerned about publications. Whereas Gordon Crewther was very interested in scientific publications and science. So your...the hides and leather group was probably not the... it was one of the top priorities for Gordon Lennox probably wasn't is that is it probably wasn't for either is that a

And Gordon Crewther didn't...one time when it must have been when I had other Gordon was away for a bit longer he took away my desk...he gave someone else my desk. I only had a small desk and so he wouldn't have done what Gordon Lennox did for me.

It's an interesting thing isn't it that you're your treatment was essentially...because of the affinity that Gordon Lennox had with the work that you chose to do.

That's right.

That's interesting. So you went to Wool Technology in 1987 wasn't it? At the time of the McKinsey restructure your group...Gordon Lennox... Gordon Crewther was probably quite happy for him to lose you...

Move to Clayton and to the Division of Wool Technology

Yes and very happy for us to come out to Clayton.

Yes - that's interesting ...

And then we had nothing to do with him after that.

And then you were part of the Division of Wool Technology. Who was the Chief of that Division then?

Ken Whitely. I got on very well with him and he supported me because he had worked with industry on the wool side earlier on. But he became Chief and he was Chief in Sydney for the wool laboratories in Sydney and he took over with us and he supported me very well.

He was also very keen on the industry connection. He was the Chief of the Division of Textile Physics?

That's right.

And then became the Chief of the Division of Wool Technology for a while and then he retired.

Yes. But he was Chief when I got promoted and he really supported everything I did. So, I was lucky I had him - not Crewther - when we moved out to Clayton. He came out to Clayton...

Yes. And at that stage, the Division of Protein Chemistry, after the 'McKinsey restructure', the Division of Protein Chemistry came into the Institute of Industrial Technologies and the wool people went into the Institute of Animal Research?

Yeah.

So your promotion and so on got out of that protein chemistry insistence on higher publications into a more practical regime of the industry division

Yeah.

So I was the Chief I was on that those promotion committees in the institute and I don't remember your case coming up. So it was in the other institute.

Yeah

Thank you. So, did you have any women mentors in CSIRO?

No, I didn't.

You as Catherine Money senior female scientist were you the mentor to people. Did people...

Yes, I was and I mentored the men as well. You know I really tried to help them along, but I found it interesting. I had two assistants working with that group and I tried to get them to do some more studying and to get promotions but they didn't. One was female and one was male but for two of them they were just happy with what they were doing - which was interesting.

So in one of the pictures of you in CoResearch in 1968, so this was presumably before you left. Curiously it was a series of 14 programs by the ABC called 'Men and Science' and it included a segment on tanning research which was filmed at the Leather Research Unit of the Division of Protein Chemistry – "Our picture shows Mrs Catherine Money on camera." So you're a female in science...

Yeah I was. But also you can go into CSIROpedia and at the bottom it's got this film. I only found it last Christmas. Someone said something about it and so on. So they've got me and the whole of that film and that was all on me with other people but it does show...I sent it to one of the tanners - the one at Gunnedah where I knew she would be interested. And she said it was "great to see me and how did it feel with all those men" because I we went out to tannery to explain all of the 'sirolime' process that they were doing and so. But this film, that's just been done on me for 'Landline'. The ABC came across that film and got in touch with me and they've just done another which was meant to be on week ago - it wasn't - but it's still going to be some time but they've used that film they said as well. But yes, that was quite interesting.

So this is 1975. You were part of the International Women's Year and in this you said (talking about part-time positions for women in CSIRO) "It's better to have half a slice of the cake than none of the cake at all". That's the way one of the organisation's leading scientists has described the appointment of women to part-time positions. Oh sorry - that's what Jim Scroggie said that about you. And since 1966, he's had you working part-time and you said "I enjoy my work and I feel I make a better part-time, rather than a full-time mother" she said "I believe it's wrong though, that many women who are happy to be full-time mothers, are made to feel guilty that they aren't working". So you're very political...

But it was true. Because I met so many people as president of school councils and I was working right through and they felt bad they were at home and doing a lot of other good things...

But couldn't be employed part-time.

Yeah.

So the employment of your research assistant, Udo Adminis, that was good that Gordon Lennox did that. That was part of the reason why you worked part-time?

As soon as I got there, I was told to employ an assistant. And I got him and we worked really well together. And then, I knew immediately when I told Gordon that Udo will stay on and do the work, because Udo and I went out to tanneries a lot. And Udo stayed on until he retired and became the problem solver. When I left, he stayed on for a while and did industry work.

So we've talked a bit about your achievements. The question is what are your main achievements as a scientist at CSIRO and how did you select the projects to work on? You've talked a bit about that because you're it was very much involved with the interaction with the Research Association. When the Research Association ended and you went on to appropriation fund and you then went into the Division of Wool Technology, that was in 1987, you didn't retire from CSIRO until 2005.

Yeah.

What happened. How were the projects selected and what was your interaction with the industry in that time after the end of the association...

Well then we had to look for other funds and we got them through the MRC - Meat Research Council and we got some good ones but we did have to work on some that I didn't think were worthwhile. And then we got an ACIAR Project.

So the Meat Research Council MRC was one of the rural research corporations?

Yes. We had quite a lot through that, but we weren't able to do exactly what I wanted. We had to conform to what they wanted. We still did do things I thought were mainly worthwhile. But then I was told to do an ACIAR Project with India. But then we started going off to esoteric things and Robin Cranston... was involved. He had these great ideas of how you could change equipment and he's very good with equipment.

Who was Robin...?

Robin Cranston. He's a very good person with ideas, but he didn't really like grants. I applied for them, but he had these many skills. He changed equipment and I knew how hard it was to get Italian equipment and get out here and make it working differently. We got money for things that I thought wouldn't work and I found that very hard. But this is the trouble of getting external money. You did what you could to get money for projects and these meat research people thought that was good. So I found that frustrating but I still justified it to myself in that we were still able to do work for the industry but we did also do these things and I thought would never eventuate. Whereas up until then I've chosen things that I thought we had a hope of getting into but...

When you say you've chosen them, from what you've talked to us previously, you chose them in very close consultation with the industry. So you knew that they'd work.

I did. I went on having a close contact with this industry and visiting tanneries and visiting when there were problems and even in setting up new tanneries so and I still do problem solving. I still work closely with A.I. Topper, who have a large, modern wet-blue tannery at Gunnedah, NSW.

So I mean I think what you're saying is quite a good insight into problems for industry. So you in a way what you've described to us is that when you were closely associated with the group of companies that were in the hide and tanning industry - you had a very close association with the Research Association but with the companies and you together were able to decide what the problems were. You had an insight into which problems were soluble by scientific research and you went ahead and did them. Eventually the funding body was a broadly based animal or livestock research association who may or may the people who are deciding the research projects may or may not have had a close interaction with the little bit of the industry that was tanning and that meant that some of the projects that this high-level committee thought were good, probably weren't.

And there was one guy who was doing the MRC management he wanted to go back to fellmongering and he got a group in Western Australia and Perth to do work which I thought wasn't going to work I knew what we'd done before what would work but they had lots of money to do that and yet we were meant to be on the one project so our people would go over to Perth and he'd run these meetings which I thought it was a waste of money...

So you were eventually a manager in CSIRO?

Finally in charge!

Yes.

Did you have any training for that or did somebody decide that you were a manager and put you in charge?

I went off to a management course once and near Sydney. New South Wales. They had that management course a lot of CSIRO people went to. And I found it very useful for me. It was a time when I really didn't think about how I hadn't thought too much about it but I saw people from other divisions say plant industry when we were given a problem she said "Well go and do this" and I said all right we're going to talk about this first. I could see a difference in management.

So when Peter left and you became in charge of the leather research, did the chief of at the time give you any instructions on what to do, or did he just say "Catherine, you're in charge now, keep going"?

Yes and get money! You know it was still this thing that you had to get external money and that was what was so hard. I think to see that difference that we had to get and that's where we did these projects that I really didn't really agree with: ACIAR salinity project in India and MRC projects.

Okay. So Catherine you joined the organisation in 1966, which was in fact, three years before I joined. I think Jerry Price would have been the Chairman when you joined. So you've gone through a lot of chairmen and chiefs. You left in 2005 when Geoff Garrett was the chief executive. What's your perspective on the leadership of the organisation during that time.

Well I think it would have been a lot better. I felt that they would all come and look around what we were doing but they didn't really want to learn about what I thought were the problems so...

So we have some questions here about the role and performance of the organisation and in CSIRO's science and during that time we had a number of you would have experienced a number of different research priorities how do we determine what we're going to do. From what you've described, your approach to research priorities is to ask the industry what have you have discussions with the industry...

And to go yourself and look and say "Right, what is needed?" but the people above me all wanted ones that you could get money for and so the emphasis became getting money for these things and then you went to places that had funding: ACIAR and MRC...

As a manager in that circumstance, did you have an understanding of what was driving that urge to get money?

Yes I know they had to do it...

But did anyone ever explain to you why that was an issue and why it was a problem?

Well I think I knew they had to get money - external money - but it was

Because the federal government was not supplying enough appropriation funds, for example?

Yes, I supposed I thought that but I also did think it was good doing research when you were working with people who were giving money but they had to be close to you so the Meat Research Council weren't. You were talking to other operators whose justification was they were getting the money in rather than what they were doing. And that's what was so good early on, that you had people who wanted to go out to industry and find out what was important for industry.

So in the technology transfer arrangements that you had in the early days were fairly simple because the industry were part of the project and the technology was being transferred directly from your laboratory to the industry, to some extent by you and Udo going to tacit knowledge transfer. Further on, technology transfer became a much more corporately the corporate centre was more interested in it. How do you think that technology transfer changed over that time when you forced to get money and you had to have agreements with companies?

Well I think it killed it. Luckily we could still go out to industry and talk to them with about things but for them to always think that you were going to charge them for it...

So in the early days did the Division of Protein Chemistry have some contractual arrangement with the companies or...

No we just went out and said look we've got this process you can try it and then they try it and then uh it was adopted. So it was very different once we had to worry more about the money.

Obviously in the early days with Gordon he said you have the research assistant. As you progressed in CSIRO, did you have to fight for people and money and equipment or was that was that part did you always have enough equipment?

Once we moved out to Clayton there was quite a lot of money available for us to move and to put up the equipment we needed - which we did - we had good drums and all of that was in that pilot tannery so we didn't have to fight for that. It was when people had these great ideas that we could make our own, you know design new machines that was more difficult...

Did that have industry support?

I think we didn't have to go in the same way to say look these are what we're doing. It was up to us to say what should be done. And you know definitely these new machines...when Robin Cranston was talking about what you could do with a splitting machine and much better splitting machine it might have worked but to tell the tanners that, I don't think they thought we'd ever have any success because the Italians and the Germans are so far ahead of us. Perhaps I was a bit negative on it, but it just was going to be something that I didn't think would happen.

But it did happen?

No it didn't. Well we put people working on it and trying to get a splitter that would split more accurately, but, you really need to be doing it with a machine manufacturer I think rather than doing it in our CSIRO lab.

So that disconnect with industry made it different to the way that you used to work?

And the difference was, that you were going to Meat & Livestock Australia (MLA). So we got money from that but t you were talking not to tanners about it you were talking to these other people and trying to convince them that it was a good thing for the industry whereas when we could go straight to the industry and we had this regular meetings where they could discuss what was going to be important, it was much better.

So in some ways the machine manufacturers were in a sense were the customer for that research and not the tanners themselves?

That's right.

And the group that CSIRO had may or may not have been the appropriate people to do research on tanning machinery...

That's right

You are the appropriate people to do on tanning processes - so that was a that's an another very good insight Catherine - that you have to research groups really have to know precisely who their customer is to make sure that they're working with

Yeah and you see when you went through someone at MRC they didn't know and they just chose projects that they thought sounded good I think that if you put up a good case for them...

In 2005, CSIRO got out of leather research who's doing that now in Australia?

The tanners themselves.

Is there any university research?

Not that I know of.

Does the tanning industry in Australia have a greenhouse problem?

They do but interestingly some years ago I said to them all you need to put in solar equipment and they have and now...

That's to provide electricity to drive the machinery right and make that carbon neutral.

Yes.

What about the chemical processes? You talked about extracting materials, recycling and also distributing by-product onto land to actually improve the land. That latter process, does that have greenhouse implications?

Yes. It's better to use all this waste as a fertiliser. If you were in a city it'd have to go to sewer.

That's right but it's not creating a problem it's solving a problem...

They are now farmers as well as tanners and they employ farmers to do it and they work out all the irrigation where it's going to go and then they say we need more land to cope with all of this effluent if you go to increase the numbers so they're doing that themselves...

Yes - and so if the tanning industry had a major greenhouse problem, that might be time for something like CSIRO to move in and help them. But what you're saying is, they don't actually have a major greenhouse problem. I mean big scale

No. They don't. You see, all our early work on recycling - they're recycling all their chrome liquors and now any excess they precipitate out the chrome, save it and use it for the future tanning making up their solutions...

So that's the recycling bit. The energy bit is cured by solar energy and the gases - emission of CO2 is solved by or at least not worsened...

Well there is some because we actually the best way to de-lime you put in the lime for adhering you have lime and sulphide and then you have to for tanning you have to then bring it down in PH for pickling and putting in the tanning agent. So you've got this CO2 deliming which we introduced to all the industry they're all using that now and...

Does that emit CO2?

Yes it does but it's usually other CO2 that's they could collect in other ways but they are buying in CO2 and that then goes well part of it forms the carbonates and goes on the land because all the effluent goes onto the land.

Okay so they're not generating CO2 - they're actually buying it in

They're buying it in and then it's going into calcium carbonate because it's taking up, we're getting the lime out of the hides. you've got the lime from unhairing you see the in the whole tanning process you start off neutral you have to go alkaline to take the hair off - everybody's tried acid – you can't do it with acid. So you go up in pH and you have sulphide and lime and take the hair off. And then, in our system, you recover the hair and we did work on recycling the lime liquor - most of them aren't doing that now because everything from the lime liquor is good on the land. It's fertilizing the land.. It's been easier for them to buy up more land and harvest the hay.

And do soil amelioration using the calcium carbonate.

Yeah. And so they have all have their effluent treatment plants where they do equalize the different ways so the pH is right to go out onto the land and then each day they irrigate.

And just as a matter of curiosity on my part, what do they grow on that land?

Hay. They've got a whole lot of crops...look, I had in my bag...I can send you some of the papers...

Look this is just curiosity...

Alright but they've got a whole range of different...

So not vegetables?

Not vegetables. It's all done with machines and they make a lot of hay and some of them...there's a wonderful tanner...he gives away...during the drought.. he had all this hay and he gave it away to the farmers who were suffering... and so they did that because they had lots of hay because they're getting the water all the time so they get the good growth so...and really I say to everybody "Go where there's land" because it's all good fertilizer. You've got sulphur nitrogen and lime and it really grows beautiful crops. But they've got about four different crops and it's happening at Culcairn. You just wouldn't set up a tannery unless...

Right but the industry knows that?

Well...and I had a query the other day from someone who used to be in the industry who was asking about it and he had no idea of that. He thought he knew but he's been out of it for so many years I said "Look you wouldn't set up unless you had land and you could irrigate".

Yes

And that's what should happen to all hides in Australia. We should not be selling salted hides because it's salt going into India and China and going on to land. You don't use the salt and then you can put all your effluent onto the land.

Has anyone written that up?

I've written it up in some things but... I'll send you what I've done...

It's a very good current day greenhouse story.

It is and perhaps that we should do that. See I've stopped writing but you're right.

Work-life balance again

So Catherine, were you ever were there any sort of professional societies that you're involved in or did you the biochemist or the royal Australian Chemical Industry or you were mainly concerned with your work in the industry? So you weren't part of professional societies but you...

Only while I was at university and I went to conferences with Adrienne and Muff. But once I joined CSIRO, I wasn't...

So your extracurricular activities were largely concerned with the school your children the on school councils and looking after creche...the council of the creche...

My experience with the farm has been quite useful for understanding problems with farmers and industry and knowing about that sort of thing because ...but yes I haven't and I suppose even I don't I stopped getting biochemistry journals and I used to read journals when I was in libraries where I had the journals but I stopped doing that. So we still get *New Scientist* at home every week and that's my way of keeping up a bit with what's happening in science around the world. I find *New Scientist* interesting to read and you do read about..

Post CSIRO work and the future of leather research in Australia

So after you left you worked for CSIRO. You were in charge of the leather research centre from 1998 to 2005. It was all closed down in 2005 and you retired, by then you were 65 anyway so it was probably not a bad time to retire. What have you done after post-CSIRO? You've kept very much involved in the leather industry?

I have. So I've kept in touch with all the Australian tanners and because this international audit, LWG leather working group audit started up, I became an auditor and so I guess...

What does that mean? What does an auditor do?

Well I have to go out to industry and go through an audit that's been set up (mainly in England) and I had a meeting last night at eight o'clock and they didn't let me in and just this morning I emailed and said that I can't get in and so I missed the meeting but I we have those once a month. So I keep up a bit with what's happening there and the audit is an international audit and now they've got too much power, I think, because all the shoe manufacturers in the world say they will only buy leather that passes this LWG audit - leather working group audit - and so the Australian 'wet-blue' tanners, to sell their product, have to do this audit. So, I'm an Australian auditor and so I keep in touch with what's being put into the audit and I can have a bit of a say - but not much.

And this is an audit to make sure that this is reaching international environmental standards and other quality standards?

Yes and you know they do have some tanneries in some countries that don't do nearly as well as the Australians. I spent a lot of time doing the ACIAR project in India that I didn't want to do but had to do to get the funding because that was ACIAR funding - Australian Centre for International Agricultural Research. And I was told I had to do that and...

So auditing and environmental standards. Is Australia up there and meeting international high-level standards?

Yeah – very well - whereas I wouldn't go into an Indian tannery because I would never be able to pass them - but other auditors pass them. I know that China and India are polluting with salt. And so the salt is going into the river system in India. It's going into... the tanneries have moved inland in China. They used to be near the sea. They've moved inland and all the salts from Australia on our sheepskins (more than our hides - but also our hides) are going on to land in China and getting away with it - which is terrible. We could be processing all our sheep skins here and not using salt, but, I've had that battle and I don't do anything with sheep skins anymore. They're all salt but with the hides, they are doing the right thing and the leather working group actually is probably overall doing a good job. But I don't believe there should be any Indian tanneries that's passing, but there are. You know, when you're an auditor they send you a picture and I said I've worked it in India because of doing this grant and you know what they do with salt. They get in the salted hides, they evaporate it down, the monsoon comes and it all goes down the river. And they're still doing it. And because they pass the audit, it doesn't mean it's going to be right. But the audit in Australia does mean that people are doing the right thing...

So Catherine, CSIR/CSIRO worked on hides and leather from 1939 to 2005 and not anymore. In some ways it's quite a long period of time to work on a particular industry problem. Do you think there's a role for another step in technology in hides and leather? So in a lot of agricultural industry, plant research, animal research, genetic engineering and modern biological methods, have played a very big part in modernising industry, and CSIRO is still very much active in plant science through modern biological techniques. In chemistry, for example, CSIRO is still very active in looking at modern methods of design of chemicals, computer working in chemistry, computer design and so on. In your opinion, is there a technology leap in tanning or is tanning always going to be basically using the processes that you invented in the 1960s and 70s? So is there a new sort of science of tanning or is it over?

The trouble is now, leather is competing with synthetics. And so anything you did with leather you have to realise but the synthetics do not have the wear properties, they still don't shape to your foot and they don't have the feel. So that's why leather is still wanted. I think more synthetics will get better and we will use more and so it's hard to know what you could do with leather that's going to greatly change it without making it more difficult to say and then the synthetic - you've got more competition with the synthetics because that's what research has done - come up with better synthetics, rather than come up with better leather.

Research in animal genetics research has come up with different ways of, I mean, producing better quality meat or I don't know what they do – changing, improving the type of wool that comes from sheep, but by doing a whole lot of research. But from what you're saying that no one's really thought about improving the leather...

By breeding better cows!

So we don't breed cows for leather, we breed cows for meat.

But we do breed them for leather in that the hide price is part of the price that people have to pay for and so they don't realise but the price of this hide is taken into account what they could get for it. When the hide market goes down because you know at the start of COVID there just was a glut of hides not being utilised and doing not functioning it's changed a bit now. But really, overall, if we're going to go on producing sheep, we should be doing something with the sheepskin and they're not being processed in Australia anymore. They were and then it's all gone to China. There's a huge tannery in China – Henan Prosper. They are taking most of the skins and they're making leathers out

of them and getting the wool and making wool and leather so if you bought a medical sheepskin now, it'll be coming from China whereas we developed the whole thing. Ken Montgomery was pushing that and he did a great job and we got the medical sheepskin. So the hides are still being processed here to wet blues and exported that way. The sheepskins are being exported salted and that is something that could be looked at - that we do something more with that but I gave up the battle long ago.

The future of CSIRO

So have you kept up to date at all with CSIRO -the modern version of CSIRO? What if you were starting from scratch now. Would you still retain CSIRO?

I would because I just think it's been so good for Australia and I just even if there's problems I still think to have a body like CSIRO is a wonderful thing and I don't know enough now I do read what I get I'd get some things but I think it's been brilliant for Australia and I think we were so lucky that they did work on leather. It's improved the Australian industry probably the hides would be being sold off and not going to wet blue. If they didn't have but now our process is used around the world. All our processes with recycling liquors no one's recycled liquors and now that's practiced everywhere. So definitely it's been worthwhile. Whether we're going to the next stage it's hard to know. Something I must say I haven't thought about but no it's a very interesting thing. What's your feeling about it?

Well this is this is not an interview with me but I mean I would keep CSIRO but I think it's a very interesting question that about hides and the science behind so hides has doesn't seem to have gone to the to another level of science like other parts of the rural industries. I don't know. So Terry have you got any other questions?

No I think it's been terrific thank you.

Yes I think he's I've enjoyed this discussion and I've certainly enjoyed the insights into how and a national science organisation works with in a sense a niche industry isn't it so...

And very interesting to me to think about what you were saying about working closely with the firms, rather than with a body which is trying to aggregate up you know to much higher where you've got a

And that's what happened with us working with MRC and ACIAR.

It's got major policy implications if that's across the board...

And the other good insight is that the your work-life balance, working having children looking after them was very much dependent that the success of that was highly dependent on the attitude of Gordon Lennox.

It was.

And probably he did that off his own back without really telling the HR department in Canberra what he was doing, rather than asking permission.

I think so.

It's old-style CSIRO of which Tom himself is a very experienced practitioner of the philosophy of you know do what you think and ask for forgiveness afterwards.

Well that's what he was and I think you need it you need it. Because really, he did it on so many levels. We were all his family and he was doing the best thing for us and you put so much effort into it and you got to know families; you know he got to know Rob. Rob helped one of his daughters with some maths when we went to dinner one time but it was that whole thing that you were part of the '343 family' and you were someone and there's still that feeling between those people he but certainly he had the legacy and I'm so glad that book was written – that just showed what he did.

Okay. Well thank you very much Catherine.

[END OF TRANSCRIPT]