Harry MEDLIN

This is a conversation with Harry Medlin on the 6th July 2011 at his home.

Harry, I think after the [Second World] War you became a student at the University of Adelaide and studied physics. You said you started honours in '49. What else happened in 1949?

Started to happen a little earlier than that. I was a Japanese prisoner of war during the War and I was really quite sick with post-beriberi and various other vitamin deficiency diseases. In 1946, it took me some time to recover. So by 1948 I got to know David Sutton and Barbara Phyllis Kidman – Barbara Potts; and it was Barbara Potts who persuaded me to allow my name to go forward to be a member of the committee of the Science Association. Now, the Science Association in Adelaide is the oldest student body in the university. It was older than the Sports Association; it was older than the union. I agreed, and from there I got into student politics generally, the Adelaide University Union, and it all started, as I say, with Barbara Phyllis Kidman.

Now, in 1949, which is what you asked me about, I started my honours year. I was persuaded by people I knew – Bryan Rofe, Long-Range Weapons Establishment: he'd been with us at Penfui Aerodrome in Timor; he managed to get out as the Japanese landed, but I was one of those captured by the Japanese, so I saw Bryan Rofe – and he was a recruiting officer at Long-Range Weapons Establishment. There was another friend of mine who did Physics III – Physics IIIB, that's the practical one that was introduced – Ren Keats, and he went into the second draft of graduates at Long-Range Weapons Establishment. Bryan Rofe and Ren Keats persuaded me to allow my name to go forward in June of 1949. I then did quit the honours that year and went into LRWE, and it was intended that we, in that third recruitment group, should be allowed to go to England and do PhDs.

Now, in England, at Cambridge and Oxford, you can enrol in a PhD without having done honours. Now, in Adelaide, as you know, you're required to do honours first. So there was no problem with me, with my going into LRWE, and I got to England and I talked my way into being accepted as a PhD student at Cambridge

University. And I became a member of Gonville & Caius College, I was a postgraduate member, and in those days the colleges were run for the benefit of undergraduates and postgraduate work in Cambridge was just starting to emerge. I became the President – see, I say I'd started to be involved in student politics. I became the President of the Cambridge Australia Club. My principal duty was to organise the Oxford-Cambridge Australian Rules Football Match. (laughs) Ren Potts was in Oxford and he played for Oxford. It was a shambles of a game, I tell you, and the English people who were there couldn't believe that they were seeing this. So that was a part of my duty.

Had you known Ren Potts before that, or did you meet him [there]?

Ren Potts?

Ren.

I knew him before, because when I came back from the War I had studied as a prisoner – and just in that thing there there's a book I made while a prisoner of war, about 40 pages. I was lucky enough to meet a Felix van Wijk. He was a Dutch scientist, and he was a prisoner of war. I became his student in the prison camp. We worked in the dust. I sneaked back into my room and I made up that book.

This one?

Yes, that's it. You have a look at it. I made up that book. Now, you weren't allowed to make notes as a prisoner and I had to hide those things. I hid them in these two books, which I found as a prisoner in Jakarta. And I showed them to the Japanese and I got them to frank it, frank both books; and I don't know what that means, but when I went from one camp to another I showed them that. Now, I hid –

Hid those in there.

– I hid all those in this book, *Tables of functions*, and this was marvellous: this is Sir James Jeans's text, which you might know, also franked, on electricity and magnetism. Now, it's all in coordinates, and – – –.

We talk about Ren Potts. I then got to know Ren Potts because I went into third-year mathematics because of that start, but I wasn't fit enough to keep up with it and Ren Potts was in the third-year Mathematics class in 1948. I got to know him. Then he became a lecturer, and he then lectured us before he went off to Oxford as the Adelaide Rhodes Scholar in 1949. I did Applied Maths II in 1949. In the first two terms before he went to Oxford in September, he took us through the whole of Applied Maths II, and he did it with vectors and tensors. Now, I'd never worked with tensors before, and the professor of mathematics, who was sick, when he came back he tried to take us through the same course and he didn't know about tensors. Now, I got very skilled with tensors, and that was Ren Potts. He learnt to be a

lecturer from [Peter] Schwerdtfeger – you know, the German who was out here and was an incredible lecturer. Ren learnt from [Peter]; I learnt from Ren.

[Harry probaly means Hans Schwerdtfeger. Peter is his son who became an academic at Flinders]

These notes, Harry, did you make those from that book? What was the source?

Well, more than the book. I made those notes from what Felix van Wijk was teaching me out in the sand. We worked in the sand, I came back to my room and wrote that up. And I say again you had to hide that stuff.

Yes. Anyhow, back to Cambridge, how did that develop?

Well, I was not particularly liked by the Australian High Commission because I was, I don't know, considered to be a fairly left-wing fellow. I was a member of the Australian Labor Party. I'd been a member of the Socialist Club at the university, I was a member of the executive. The executive of the Socialist Club was made up of seven people: three of us were non-communists; there were three communists; the chair was a non-communist but was married to a communist. So you need to remember that these were the days of the McCarthyite attitudes, which crept into Australia through Robert Gordon Menzies. So anybody – and I think it was – which year was it? I think it was 1952, about then, that when Menzies was Prime Minister they ran a plebiscite to ban the Communist Party, and the plebiscite failed. I was one of those – my wife and I and brother were those who were helping Don Dunstan. In fact, we had then bumped Dunstan into parliament in 1952. But I had political problems because of my misconceived Labor Party membership and attitudes. As I say, if you were an aggressive member of the Labor Party, you were almost necessarily a communist. Well, I was not a communist, never have been.

So that impacted on your future at Cambridge?

Yes. I came back to Australia and recommenced honours and was paid by the Department of Foreign Affairs, whatever it was called – no; Department of Science, I think – paid during my honours year. I was also made a demonstrator in the Physics

Department. But I took no remuneration because, as I say, my salary was still being paid by the Department of Supply. And I completed honours then in 1950.

1950.

1950, yes.

First-class honours.

I got first-class honours, yes. And after I became lecturer I found out that I was second. The one who topped the honours was Alan Weiss.

Ah.

He was a bright fellow.

Yes. What became of him?

I really don't know. Some of the photographs of the Physics Department that I have here to hand over to you, one of them shows Alan Weiss. Yes.

So that was 1950. Then in '51 you were appointed as a lecturer.

Yes. Well, in 1950 I met Stan Tomlin and I was very impressed by Stan Tomlin and I think I'm immodest enough to say he was impressed with me, and he wanted to set up a new department or a research group in biophysics. Stan did Honours Physics in Kings College, London, during the War; I think he did his honours degree and topped the Honours Physics for many years. I think he did his honours degree in – well, during the War. He won a prize. He invented something to do with radar detection. I'm not too sure what it was, but he won a prize. He came out here because they had a daughter who was handicapped and they shifted to a more appropriate climate. Unfortunately, the girl, when she hit puberty, died. The son, John, is still with us; he works in the United States – John Tomlin. He did a PhD subsequently with Ren Potts. But that was where I first met Stan Tomlin, and it was he who revolutionised the teaching of physics, because with Sir Kerr Grant, Roy Burdon and Mr Fuller there was no sophisticated – there was no quantum mechanics; there was no relativity. And I've had lecturers giving lectures to me on

electromagnetism, they didn't know whether B was μH or μH/4π. (laughs) Now, pretty fundamental difference. So Stan Tomlin – I'm sure you want me to return to Dr Tomlin later, because in the period when he was interregnum between Sir Leonard Huxley and John Carver he revolutionised the Physics Department.

Yes. I think we'll come to that.

Yes.

I wonder if we could talk first about the biophysics, how that work started and developed.

Yes. Well, I was the first one in that department and I came across an old X-ray set and I got an X-ray tube that is still in, or was still in, the museum that I had created. You remember the time of the Bragg Centenary –

Yes.

– in 1986. I still had that tube. So I had this pretty crude gear. Stan Tomlin also set up electron microscopy. So we had X-ray diffraction and electron microscopy. They were in the room on the northern side of the Physics Department. As you come up the western stairs the room was right on the left. My subsequent laboratory was just to the right of that. I'm not sure what, if anything, is in that room now. There was also – yes, I, through research grants, got electron microscopes and also optical microscopes, and if you know what you're doing with an optical microscope you can discover a lot about the crude morphology of crystals – well, you can tell whether they're monoclinic or triclinic or you can tell what the system is. You can't tell the space group; you need X-ray diffraction to find the space group, of which there are 230, as you might or might not know.

I can remember an electron microscope up there. When was that acquired? Was that some time after Tomlin arrived?

Oh, yes. Yes. I can't remember the – – –. There were various people who used that, too. He got people, the names of whom elude me, to come from the Faculty of Medicine to use that. Now, I'm not sure of the research work they did. Are you going to interview Barbara Potts?

I guess I will eventually, yes.

Yes. Well, she had something to do with that. In fact, she did a PhD there. And Elizabeth Roban[?], Elizabeth Irving. Both friends of my late wife, who died. There's Elizabeth who is now dead. I think they both did PhDs involving microscopy. Well, I tell you it was pretty hard work in those days. We didn't have access to crack computers, like they do. In fact, we used to add up Fourier series with cards, you know, boxes of cards. Well, you can imagine what that's like.

In fact, I first struck computing in Cambridge in 1949, and we had to write our own scripts. I think it was called the 'box computer'.

What else was happening in Physics at that time? Huxley was here, and he started research in several areas.

He did. He certainly – well, there was radio research with Graham Elford, and you've interviewed Graham, I think, haven't you?

Yes.

You probably know about that.

Yes.

He also started electron work with Bob Crompton and Graham Elford's brother and I've forgotten the name of the technician from the workshop who worked with them. They were on the top floor of the Physics Department down the east – – –. When I say the 'Physics Department', that is after we took over – you know, that building was initially half Physics, half Engineering.

Yes.

In fact, the room I had was the room occupied by the professor of engineering. Beautiful, looking out over the northern side and before the – – –.

Bragg Building – oh, before the Darling Building.

Yes, certainly before – well, Darling didn't matter to me; I'm not too sure about that; but certainly before Bragg, and it was certainly before Badger, because I could look out from my window to the Adelaide Oval and I could tell what was happening at the

cricket, and I knew whether or not you were able to nick off down – and it was a pretty short cut to the Adelaide Oval in those days. If it was an interesting match going on I could nick off down there.

So what was the spirit of the department like then? Was there a spirit of the discipline blossoming in various directions and a sense of excitement, or were the various groups independent of each other?

Yes, I think they were. I think they were independent of each other. In fact, Professor Huxley was much more interested in his own research group than in us. And Roy Worthington and I – Roy Worthington was also a PhD student for Stan Tomlin. He did X-ray diffraction and he worked on chlorophyll. Now, that's a tricky compound. I think the research – the repeat there is about 640 Angstrom units. Things I'm talking about were just of the order of tens of Angstrom units. But you get, you know, chlorophyll molecule, and it's pretty tricky. And we were pretty well isolated, I would have thought. I distinctly remember Len Huxley. He'd come every day down to Crompton's lab, and he was very actively involved with them, and one day he came into our research lab, and I got this thing put in the Physics Museum at one stage: it was an electrostatic voltmeter, huge parabolic thing, two parabolas, and the centre of this one was a movable disc, and it'd go up to about 75 kilovolts. Well, you see, we were using copper – the radiation for copper Kα is about nine kilovolts, so you run it at about 30, 35 kilowatts to get some energy into the pulse, and we used to leave this thing on the floor. And one day Len Huxley, coming back from Crompton, walked in and he put his hand on it. (laughter) Oh! If it had been live – well, if it had been live, we wouldn't have let him anywhere near it. But to put his – and he was an electrical engineer – to put his hand on what could have been 50 bloody kilovolts is – – –. No. The answer to your question is I think the groups were pretty separate.

What about the solid-state work, the thin-film stuff; how did that begin?

That's eluding me at the moment. You'd better give me notice of that, I think.

Well, let's go back to the biophysics, then. You had some outstanding students.

I certainly did. There's one went off to the United States, Graham Gurr. He's back here in South Australia. There's another one – there are two in particular: Brian Wesley Matthews and Peter Malcolm Colman. They were both my PhD students. I've seen them recently and I reminded Brian Matthews that it was I who made it possible for him to do Honours Physics, because he – now, I don't know why, because they came from a reasonably affluent family in Mount Barker – he grew up in Mount Barker with a fellow who because subsequently Chancellor of Adelaide University. Anyway, I think they were reasonably affluent. And he was telling me that, in the early days of Stirling up here, his grandmother owned a shop. Now, this shop's been written up by a fellow who wrote a history of early Crafers and Stirling, and I've got the book in here somewhere, but if you ever go downstairs and see the books that I've got you'll notice that – you won't be surprised that I can't find the damn things. That was Brian Wesley Matthews. Anyway, he was in the Education Department as a teacher trainee. Now, you know they used to be in that building in Kintore Avenue before the university took it over?

Yes.

Well, Brian Wesley Matthews, I had him as a third-year student. I persuaded the director of teacher training to allow him to do honours. Now, previously, teacher training students were not allowed to do honours. They got third year and then they went out as apprentice teachers. I persuaded him to let Brian do honours and he was my honours student. He got first-class honours, and he then enrolled for his PhD. And he had to pay back – I think he was a bit like me when in my fourth year I – see, for three years I got my fees paid and I got a wage, and in my fourth year I borrowed money. I paid it back at a shilling a week.

Yes.

And I think Brian Matthews paid back his –

It was a bond.

– teacher training bond thing at a shilling a week. He then went off to Cambridge and then he was Professor of Physics in Oregon State University and set up a

biophysics research laboratory, and I was telling you about how he solved the structure, among other things, of chlorophyll – huge organic molecule. The other student I had, who's been outstanding, was Peter Colman, and at the last commemoration here both those students got D.Univs, Adelaide D.Univs, and there's a photograph of him here in the magazine, photograph of the pair of them: Brian Matthews and Peter Colman. And Peter Colman solved the first computer-designed drug. It was the anti-influenza drug, Relenza. Now, influenza is a protein. Its capsid head, they're curious structures. They're like – can you see that ball there?

Yes.

Sepak takraw. It's a famous ball in Indonesia, Malaysia, Thailand, and it's also a crucifixion ball. They put criminals in there, bowl them down the river and over the cliff. Now, that ball is actually played with. Downstairs, I have made models. The three-dimensional space group of the sepak takraw is 5:3:2. If you look at it, you'll see pentagons, triangles and rectangles. Now, protein capsid molecules, like the influenza virus, have that 5:3:2. Therefore, they can sit in crystals. They're not part of the crystal structure because, in three dimensions, five is not a – 360 over 5 is 72, which is – you know, you can't – – –. The three-dimensional numbers are 1, 2, 3, 4 and 6; 5 misses out; 8 misses out.

7.

Anyway, I've made models of that, and Peter found this and on that thing stick out two what they call glycoproteins, and one of them, if you get the virus in you, one of them opens the cell so that the virus gets inside, the capsid head breaks up, the virus then corrupts the cell DNA and reproduces itself, right? It reproduces the virus. It also reproduces that thing. Now, that then has to get out and it eats its way – the neuraminidase is then the active site that eats its way out of the cell and replicates the virus. Now, in that glycoprotein – here's the capsid, and sticking out is this head, and in there is the active site that bites through the cell to get in and then get out.

So what Peter Colman did is computer-designed a drug that fits in there and blocks its ability to replicate. Now, that means that it is not an antiviral thing – you

have to get the flu before you stop it. Now, there were people in Sydney who joined up with people in the United States, and they pretty well copied that Relenza, but, Alastair, they made a mistake because – I don't know where to start this, really, because when he put that in there it sits in there because of very curious bonds that were discovered by me in my PhD. I had parabanic acid which I made – I don't know if you know it's a five-membered ring, C double-bond O, C double-bond O, C double-bond O, NH_2, NH_2. So you can imagine with the hydrogen, N and O there can be hydrogen bonding. Now, that's planar, that molecule, and it's monoclinic, so in the planes they go like this and planes down below. Now, I was in trouble in my thesis because I had found out that there were contacts, interplanar contacts, between the two sheets of – this sheet and this sheet, that were shorter than hydrogen bonds, right?

Yes.

Now, hydrogen bonds are what hold you and me together, right, and they're about 2.7 Angstrom units. Now, these things were shorter. Now, I was terribly worried and I was puzzling about this and whether I'd made the wrong crystallographic decision. Anyway, Ren Potts came and said, 'In the latest issue of *Nature*, scientists in the United States have published a pre-thing about parabanic acid.' So I wrote to them and said, 'Hey, what the hell's going on? What about these short contacts?' Now, the funny thing is this: this was is the monclinic acid, right? Now, these bonds are quite short, shorter than hydrogen bonds, but no energy because you could cleave it. Now, you can't cleave hydrogen bonds. You try and see how you get on. You won't get on at all. You can't cleave the bloody things. But these just cleaved, and it was quite remarkable. Anyway, I finally got my PhD and – – –.

Who supervised your PhD?

Stan Tomlin.

Stan Tomlin.

Yes. He sort of supervised me. I used to see him from 9 to 9.15 every Monday morning, and I'd go and sit there and he'd say nothing. (laughs) Just sit there for a

quarter of an hour and out I'd go. Anyway, I gave Peter Colman for his PhD, and he was also my third-year student – in fact, I was the one who first started having third-year students, right? Previously, you could only have honours students. I started the third-year students and then honour students.

Doing projects?

Yes, doing project. And Peter Colman, I gave him urea parabanate. Now, I don't know if you know urea, but it's a small molecule: CO-NH_2 twice, right – carbon, oxygen, double-bond oxygen, nitrogen H_2, nitrogen H_2. And he found out that these also were planar structures, because urea and parabanic acid are both planar. And he found out that there were these contacts again. His thesis was to write the wave functions of those contacts. It's never been done, ever. Nobody has ever done it. I wish I was smart enough to be able to do it. But it should be possible to write the wave function.

Anyway, X-ray crystallography was advancing and he got through that more quickly than I got through parabanic acid, so I then gave him thiourea parabanic acid, right? So the thiourea, instead of CO-NH_2 twice it's CS-NH_2. Sulphur replaces oxygen. They're the same valency. And he did both of them. And that also. Then there was a fellow called – I think his name was Compton. He found 19 other, at the time, similar compounds with these intermolecular contacts that I say again were shorter than hydrogen bonds but which were cleavable, and nobody has yet written the wave function. So those two students were brilliant.

What was Brian Matthews's work? What did he become noted for?

Well, he did chlorophyll. And he's done a lot.

Yes. Could you talk about that a bit?

Yes. Well, chlorophyll is a very complex molecule and you might not expect to find the structural solution of it. It turns out, if I remember it, that there are seven of these molecules, seven of the chlorophyll molecules, in the unit. It's monoclinic again, but seven is not a crystallographic number, so you can imagine how tricky it is and how complicated it is. I think it took him about three or four years to work out the

structure of that. Mind you, at the University of Oregon they had a very active mathematics department which were working on these Fourier analysis things, and I think that helped him, helped him enormously.

He found the structure of chlorophyll. It was groundbreaking work, and I said to him – I think I've mentioned this to you at some time before – that, 'As a physicist, what you have to do is solve the business that chlorophyll is engaged in when it is photosynthesising,' because chlorophyll is the green stuff in all those leaves that's responsible for the photosynthesising of plants. He didn't do it, he got onto something else. It was done finally in Münich in Germany, Muenchen, by a group of three: two Germans and one Canadian. And, as you probably know, the Nobel Prize is shared only three ways and so I think Brian Matthews came fourth out of three. If he'd solved it as it was photosynthesising he'd have been a Nobel laureate. And I think there's a chance that Peter Colman still might be.

Harry, I wonder if we could go back to Stan Tomlin and his contribution, first of all to all this research work. What did he involve himself in, in terms of research?

(strong sound of rainstorm) Essentially thin films, but I don't remember the detail.

So that's a story we'll need to chase up somewhere else, but that's where the thin films fits in – it's really with Stan?

Yes. I think you'd be better off getting that out of Barbara Kidman, Barbara Potts.

Then what about teaching? I gather that Stan is the person who really brought quantum mechanics into the Adelaide curriculum.

Oh, yes. Yes. Yes, he revolutionised the thinking of the Physics Department, and I think I've written in stuff that I've shown you there were two of them, both Englishmen: Basil Briggs and Stan Tomlin. Now, I didn't see as much of Basil Briggs because he was in the electromagnetism side. That address I gave to the women's club, Basil's widow was there and so was Stan's. These women outlive us, you know. They were both superb academics. They were both silent, quiet people. Has Graham said anything to you about Basil?

Yes, yes.

Yes. They were not aggressive, like – well, I won't mention any names, but there was a few aggressive people round Physics. (laughs)

Yes. Both outstanding scholars. I always remember Basil would write a paper in his head.

Yes.

He would edit it and correct it and when he had it right he'd write it down and send it off.

Yes. That doesn't surprise me. But Stan, yes, Stan introduced quantum mechanics.

What about relativity, how did that get into the Adelaide curriculum? Was that a part of – did you do relativity in honours?

I don't know. I would have thought that was more likely Angas Hurst.

And so it was a bit later.

Yes. (rainstorm continues) Yes, relativity: I think about the only relativity I did was in prison camp (laughter)

Then what about – going back to Stan Tomlin's contribution, I think he made contributions to what you might call departmental governance.

Sure did, in the sense that he allowed people academic freedom and encouraged vigour. And that was when he was interim head. He was interim head between Len Huxley and the arrival of John Carver. And I think that was about a year. I think there were some troubles in the appointing of a physicist. I remember – – –.

Yes, there was a period of about a year, I think.

Yes. I remember I was demonstrating in second-year Physics – you know where the second-year lab used to be, on the first floor right down the eastern end?

Yes. Still there.

Is it?

Yes.

Including the room on the right-hand side, the anteroom to it? Which I discovered Dr [?Burdon] used for his surface tension of mercury, and we pulled up the mouth of it and it was awash with mercury. (laughter) God! And people have been in there for years. I don't know what the vapour pressure in that mercury was in that room. It would have to be terrible. Just a pool of mercury.

Now, I was always interested in government and I was one of those – in fact, I pulled out this *Harry Medlin rooms* thing because it talks about my role in the union and getting self-government and involving staff participation in the affairs of the union and involving students and having the union council govern itself. When the union was first established, and in the book *The lower level*, which is around here somewhere, the first president of the union was the chancellor of the university. (laughs) How'd you be? Well, Stan allowed and encouraged this movement to come through, and he allowed me to set up a departmental committee. Which year was that?

It would have been about 1960.

Yes.

Carver came in '61, I believe.

'51.

'61.

'61. Well, yes. Okay.

I was a student then.

Were you?

Yes.

Were you on the departmental committee?

Don't remember.

We set up the departmental committee. I was the secretary/convenor of it, and it was comprised of academic staff, lab staff, students – both postgraduate and

undergraduate – and, as I say, I was the secretary/convenor. That was the start. I became President of the Staff Association in Adelaide in – when? – about 1970, '71, I think. I then became President of the Federation of Australian University Staff Associations. I wrote a paper in the *In vestes* on the case for an association of Australian universities, and we got that published and I persuaded the Adelaide University to approve this, and we had a national forum, people from all over Australia. It never got anywhere, of course, but it was the same moving principle that was behind the notion of departmental government, where academics govern themselves, right? And they then contributed to the faculties and to the council.

It took – I think I've written it up somewhere, perhaps in the stuff I sent you – it took about five years before we got council approval for there to be departmental government generally, and I attended recently the funeral of John Hipper from the Architecture Department, senior lecturer in architecture, and he, it turned out – I'd forgotten this – he became the chair of the departmental committee in Architecture. Well, of course, this couldn't be allowed to go on. The bureaucrats, they can't have academics governing themselves. And so you might have seen where I've written, both locally and nationally, that academic collegiality has been replaced by bureaucratic managerialism. I mean, departmental government has gone.

Departments have gone.

Yes. And, well, I mean look to what happened to Union Hall. Good lord!

Harry, you talked about Stan encouraging both academic freedom and vigour. What did you mean by 'academic vigour'?

Well, you see, well, I am by way of being a vigorous person, and he encouraged people like me. There were many people who abominate the sorts of ideas and promotions that a fellow like me comes up with – case for an association for Australian universities. The then Vice-Chancellors' Committee have to get rid of that. But he was – what's the word? – compliant. Yes, that's [the word]. Yes, he was compliant. He allowed it. And I think basically he approved of it. Vigour.

Well, as I say, it's pretty vigorous for a department like Physics to decide that it's going to govern itself.

Yes. Now, then – – –.

I can tell you a bit more about that. While I was looking after second-year physics laboratories, I saw a bloke – – –. And about that time there'd been people coming in – you know, we used to leave our purses and pens and stuff just in the room. The rooms were open. The girls would leave all sorts of stuff. And suddenly – well, I don't know about suddenly – but things started to disappear. I guess these days everybody still locks their room in the Physics Department. Anyway, they were at that time. And there was this fellow, upstairs, halfway between the stairs and the entrance to the Physics II labs, this tall fellow, and I said, 'I'm Harry Medlin. I'm a demonstrator here. Can I help you?' And he said, 'Oh, I was just looking around.' I didn't know who he was, and he didn't look like a thief, anyway. So off he went. I can't remember whether I showed him the front door or what, but – – –. And it was a year later that he was appointed.

Now, Basten was the vice-chancellor, and John Henry Carver came into the university, went to see the vice-chancellor, was told that he was the BV[?] Elder Professor of Physics, said, 'You know where it is. You've looked around down there, you know where to go.' So, next thing, there's this fellow, this same bloke, in the department, and I said, 'Oh, who are you? I've seen you before.'

And he said, 'I'm Professor John Carver. I'm the new Elder Professor of Physics.'

I said, 'Oh, you know we govern ourselves here now. We govern ourselves. We've got a departmental committee.'

He said, 'Where's the nearest pub?'

And I said, 'The Richmond.'

And we (laughs) spent the rest of the day in the Richmond while he sucked me dry about the [department]. But he was pretty good, Carver, I think.

He maintained the academic committee.

Yes. Yes, he did.

What would you say his impact on the department was. How was it a different department in the Carver era?

Well, it was different, and I'll tell you why. You remember Grem Bevan?

Yes.

Now, I could never figure him out. I think he got a second-class honours in London somewhere. Is he still here, do you know?

I don't know. He retired a long time ago.

Funny fellow, Grem Bevan. Had an interesting life. He came out here and he was – he played the real smartarse Pom, and I don't think he was as bright as he thought he was. Anyway, on the ground floor of the Physics Department on the western end there was a lot of space there. Now, I think it's a tearoom now, isn't it?

Yes, sort of tearoom/tutorial room.

Yes. Well, when they launched the bust in there and the Duke of Kent or whatever his name was came, it was held in there and – they destroyed the museum, but some of the useful stuff, some of the interesting stuff from the museum, it was put in that room. Whether it's safely stored there or not I don't know. Anyway, that was a long open space, and above it was the lecture theatre. Now, David Sutton has set up his geomagnetic or whatever – – –.

Seismic.

Yes. The seismic stuff. He was down there, or had been down there. Somehow or other Bevan got there. Somehow or other, Bert Green and Angas Hurst wanted it for somebody, I don't know who. There was a big fight between Bert Green and Stan Tomlin – and it's interesting at the wives' club to see Mrs Green and Mrs Tomlin. (laughs) They're still a bit stand-offish. But I was surprised that this became so hostile and there was such a bad feeling between Mathematical Physics and Physics. There was Green, Hurst – well, Messel had been there; Messel had gone; Ren Potts had been there and Ren was down in Mathematics; and there was another fellow

whose name I forget. And the other thing about them, they used to pinch our students. (laughter) So that's one thing that Carver did: Carver effected a reconciliation. I don't know how he did it. But there was a reconciliation between Physics and Maths Physics after the interregnum. I think he was a pretty crafty monkey, John Henry.

That reconciliation between Physics and Maths Physics, I'm just wondering if you could comment on the relationship between experiment and theory. I remember when I was a student and I went to one of your courses, you gave us a booklet, an essay, written by Max Planck, I think, on experiment and theory in physics.

Yes.

That seemed to be important to you.

Was then. The paper's down below somewhere. (laughs) Max Planck. Yes, I should remember more about that than I do. Didn't he get out of Germany and wasn't he in the Cavendish?

Could have been. I don't remember.

I don't think he's in that photograph that I've got here of me in the Cavendish.

But I'm wondering, with the Physics Department and the Maths Physics Department alongside it, were there effective links?

I think so. Well, they were involved in lecture and research projects. As I say, they used to pinch our students.

The other link is the one between teaching and research. Was that an important – was it important to you that the teaching took place in the context of a department which did research?

It was certainly important. It's essential. I think – yes, I think when I spoke about the move to try and save the Union Hall I spoke something about – that might have come from Planck, actually – about the essential nature, the essential nature of universities. Ah! I remember that paper, yes. Yes, the essential nature of universities in research. Yes, and then when I spoke down at the Union Hall about the lower level I complained that so many people were calling it '*re*search'.

Re*search, re*search. I think I said something, in that address I gave to the women, about the essential intellectual component of the universities. I know I was not long out of the presidency of FAUSA before the Labor Government came in. In fact, I spoke at a public meeting in Victoria Square, and I've forgotten the name of the Labor Party minister who trivialised the universities by making a lot of what were technical colleges – well, for example, the School of Mines – – –.

The feeding ground for a university, quality, is a million – that's a worldwide figure – and I see McWha boasting about Adelaide being ranked as one of the top hundred universities in the something or other. I think when you take the university as a whole I think it comes within the first 200. But the essential, the essential nature: universities are learning institutions. They're not teaching institutions; they're learning institutions. And students learn from intellectual contact with their seniors. And academics learn through the serendipitous nature of research. And I've quoted a former head of the AVCC on the question of serendipity. Did I quote that stuff to you? 'Great discoveries are made with serendipity –'

Don't recall that.

'– and interpreted with sagacity.' That's what universities are about, and that's what research is about. It is not about fact-finding.

Yes.

The other person that I'm very interested in in this general area – in physics, man and society – is Karl Popper.

Yes. Could you just talk about Physics, Man and Society – that liberal arts-type subject that you introduced – could you talk about how that came into being?

Who allowed that? It's 2934, that I remember – that's the number of the – Physics, Man & Society. They gave it to – I said I gave it for 10 years. Now, I got out of it when the lunatic lesbian left were around, so I finished in about 1990. So I would have started in about 1980. No, no, no. Would have started about 1975. I wrote the précis, and I think I said in one of the papers to you that the present précis of Physics, Ideas and Society I think is almost identical with what I wrote. I think the supporters

were – – –. See, we had to get it through the Education Committee – well, there's no Education Committee any more – the Education Committee, and, well, the Finance Committee and the council, so probably about in the early 1980s, and I think the supporters were – ah, yes: Tomlin, Green, Briggs, Prescott.

What was the rationale or the philosophy that drove that course?

The rationale was this – I remember that distinctly – was to allow properly-motivated and intelligent people to comprehend – yes, it was an interdisciplinary thing – to comprehend the great principles of physics, and I certainly remember this distinctly. Now, I claim – look, there are 16 great principles in physics: classical mechanics, electromagnetism, thermodynamics, quantum theory, relativity, and you can run out 16 general principles. Now, my assertion is this: that, with properly-motivated students, and proper tutorials – and we limited the course to 24 students, eight in each of three tutorial groups, right? And the maximum size – I've been in arts departments where 20 people are in a tutorial group, and I've been and done an arts course, you know, arts, Politics I, II and II, and you get these huge tutorials, you learn nothing. You comprehend nothing. Alastair, there's a difference between comprehending something and being able to do it. Now, as I say, properly-motivated students could, at the end – and I've got all the papers down there, the marks that were given from tutorials – – –. And that's another thing we introduced, before – when was Flinders set up? Because I was doing this stuff before Flinders was set up, because I believe in student assessment. We were compelled to have exams, but in Physics I and certainly in Physics, Man and Society we had group assessment. And the group could contest, and if they were successful change the mark. I never had any trouble at all. We limited the thing to 24 people. Does Roger limit it to 24, do you know?

I'm not sure.

Limited to 24 with, as I say, three tutorial groups of eight, and they could and they did and they had to comprehend the 16 great principles of physics. Now, they couldn't do it, right, but they could comprehend. They could comprehend the Law of

Gravity; they could comprehend what people had to say; they could comprehend what Garibaldi (sic)[Galileo] had to say on his deathbed – I've forgotten the Latin – but, 'It does move.'

So they could comprehend the principle without having the mathematics to do it.

Absolutely – they could comprehend it without being able to do it. And I have asserted that they could comprehend it better than a lot of second and even third-year students, who don't bloody comprehend anything.

But can do it.

(laughter) Yes, they write all this crap. Now, did I mention Mirna Heruc?

No.

Well, I now will. I've had a lot of dealings with Mirna Heruc, and she was one of my students in one of those groups, and (laughs) she's told me she was in this tutorial group and I said, 'And what do you think about that, Mirna?' Now, she's a little Slovac girl and she said she had never been allowed to think anything for herself; she could only think what she was told to think. (laughs) And she nearly had a fit when I asked, 'What do you think about that, Mirna?' Well, she's a very different woman now, and she's the one who brought me all this stuff. And *As many lives as a cat?*, I had a lot to do with the writing of – in fact, I got that book written by – have you ever seen it?

No.

By Kerry Round in the History Department. Aha! 'Photo courtesy of Harry Medlin'. I tell you, there's more rubbish around – all these photographs are Harry Medlin. Yes, there's the old interior – 'Photo courtesy of Harry Medlin' – and that's where the Guild started. Anyway, yes, Kerry Round wrote this stuff, and it's very interesting that the active people in the Theatre Guild are people like George Mayo, right, Harry Medlin, Jim Silsbury, Peter whatever his name is – a couple are from Physics – they're all scientists.

Yes.

And the arts people just talk crap and can't – – –. Brian Coghlan is a bit different. Do you know Coghlan?

Not very well, no.

Professor of German. He's a bit different. Oh, there's Barbara West.

So do you think the Discipline of Physics has a special role in the university, has had a special role?

Oh, yes. Oh, yes.

What is it – what's distinctive about Physics?

I think it's the breadth of intellectuality. You take a fellow like Tony Thomas. There are not too many people around like him. Well, even Ian McCarthy. Did you come across Ian?

Yes.

What killed him, do you know?

No.

Yes, I showed him round Cambridge. I was in Cambridge when he turned up. He was lost. He was chasing a girl. He used to sneak into the Physics II laboratories following this girl. She finally gave in and let him marry her. (laughs) What is it about physics? Well, it is a discipline that, properly understood, convinces us that we haven't the faintest bloody idea what's going on. (laughs) And I shouldn't ask – are you a Christian?

Yes.

Yes. Well, then, I'll tone myself down. I could never understand David Sutton. He was a very rabid Christian. And I'll tell you something about that.

Presbyterian, I think.

Yes. I've just taken to lunch John Sulan, Justice John Sulan – you know, I knew him when he was a little kid and his mother taught [for Didi ?] and his mother was – he's Jewish, and his mother was a German prisoner for seven years. Only two years in

Auschwitz. She survived because she could speak seven languages. And she had a marvellous saying: 'Ah, it is vomitable. Vomitable.' (laughter) Anyway, John Sulan and Elliott Johnston – you know – I've got his book, the book there, *The red silk*, and he had to give up communism when he became a judge because a judge is not allowed to be a member of any of those parties. Now, I'm coming round to what this was all about. I mentioned before that English philosopher – his name eludes me at the moment, Paul whatever – who put the idea that there is no such thing as absolutes. What's his name, Paul – I think I mentioned him before.

You're not talking about Paul Day, are you?

No. No, not him.

Particularly not – – –.

Much shrewder than him. His name will come back. He was a European Jew. He was in New Zealand during the War, and he was lucky because Hitler would have disposed of him. Now, he says there is no such thing as absolutes, and I say again great discoveries are made with serendipity and interpreted with sagacity. But the only thing you can establish is that something is wrong. A fact will destroy a theory. And we get the Christians saying that the Universe moves around the Earth, and then there was all the troubles with the Church, and Galileo said on his deathbed in Latin, 'But it does move,' and, 'The Earth is moving,' and we have to keep on making concessions as facts are discovered. Paul, Paul, Paul – come back in a minute. 'A single fact will destroy a theory.'

Anyway, at this lunch – and John Sulan is a Jew, and Elliott Johnston is a communist – I said, 'I've given twice now the address at the celebration of the massacre of the nurses by the Japanese on Radji Beach on the 16th February 1942,' right? They massacred everyone except Viv Bullwinkel, who was shot through here, and lucky it didn't hit anything, and she could hide and got home. I saw a lot of her after the War. And I quoted to them John Milton wrote a poem, the *Areopagitica* – do you know it? You know who Milton is?

No.

In 1644, this poem is based on the hill, the sacred hill in Athens, the Areios Pagos. Have you been to Athens?

No.

Right. Well, you can imagine the Parthenon.

Yes.

Right? You come up to the Parthenon. If you look north from the Parthenon there's a valley, and the next hill is the Areios Pagos. That was the meeting place, the home of free men, right? Not free women and not slaves, but the home of free men. And they established the notion of the freedom of the mind. They gave us the principles of liberal democracy. That idea went from there to the Levant, the Middle East, and was picked up by the Jews, the Christians, the Muslims and the communists. All four of those groups subscribed to absolutes, all four of them. Popper, Karl Popper.

Popper.

Popper. And Karl Popper has destroyed that: 'There's no such thing as an absolute. An observed fact will transform it.' And, as I say, that idea of liberal democracy comes out of the Areopagitica of John Milton, 1644. Well, I tell you, Elliott Johnston, even though he's had to leave the Communist Party, he wasn't too pleased to hear me say this and I don't think Johnny Sulan, who's Jewish, was too pleased. So I just say again in that article that I had in the *Weekend Australian* magazine, Alastair, we haven't the faintest bloody idea what's going on. Tell me about String Theory. It's bullshit. Oh, I shouldn't say that. (laughter) Paul Davies and all this yapping about String Theory. God!

Harry, the story of Physics in Adelaide is, in a very significant way, the story of a series of Elder Professors.

Yes.

Huxley was one of those; Carver was one of those; Prescott was the next, I think. Is that right?

I'll say yes.

Do you want to say anything about his role –

About who?

– in Physics in Adelaide?

About whose role?

John Prescott.

Yes. Very, very interesting, very interesting man. Some of the pictures I've got here involve the Bragg Centenary, and – although Graham Elford was the chair when I was the organiser that set up the whole of the Bragg Centenary, I ran the thing. And one of the photographs shows Sir John Prescott chairing the dinner where they thank me, you know, the visiting professors. Now, you're in one of these.

Yes.

There's Kerr Grant. Bragg Centenary. He's handing me the little booklet that I got out and they all signed and said thank you. I think the speakers at that thing were – yes, John Prescott, Harry Medlin, John Carver and Stephen Bragg. Yes. Stephen Bragg's got a relative out here. Yes, they were very kind. Prescott said, 'Thank you, Harry, for an impeccably-run centenary celebration.' These are for you. Alastair Blake, Helen Blake. They attended. Yes, they're all the people who attended. So I thought John Prescott was very sympathetic to this sort of communal activity. We got an interesting telegram – and I've got a copy of it here – from Lady Adrian addressed to 'Medlin, Physics'. (laughter) She was the daughter of Gwendoline Caro[?], the wife of Lord Adrian, Master of Pembroke College, Cambridge, Vice-Chancellor of Cambridge University: 'All success to your celebrations of the Bragg Centenary and to the future of the department, from Bragg's son-in-law and daughter and daughter-in-law.' Yes.

I don't know why Graham Elford is not there, because he was the chairman of the department when I set this up. Alan and Maxine Ewart , there's Vincent up there.

What about Alan Ewart? Do you want to say anything about him? He was a key figure in a lot of that work.

Yes. Yes, I do. He was incredible. I think it was Stan Tomlin who took him on, and if you see that object there?

That brass thing?

Yes. Pull it down. When I finished and I had to go from salary to superannuation at the end of 1995, when I turned 65 – no; '86 –

'87.

– yes, that's when the presentation was made – there was a thing down in the union. I was presented with the doctor of the university, and (laughs) – talking about John Prescott – he spoke at this presentation. That was made by Alan Ewart. And in the D.Univ presentation it said that I'd been an apprentice in the old Adelaide Electric Supply Company and went back there and I got – what are they called? – the fellowship of the institution – not institution – of electricians. Oh, electricians' diploma, or whatever it's called. They're in a photograph over there. Anyway, John Prescott in the function in the union said, 'I wish I'd known that. I'd have had Harry look after our electrical – – –.' (laughs)

But anyway, that's Alan Ewart's. Beautiful, isn't it. I was so impressed with it.

But he was the technical genius that made a lot of the work possible.

Yes. Yes, he was. And I pay credit to him because, as I say, with the Bragg Centenary, I directed the thing, wrote all the blurb and got the Foundation to fund the visiting professors, Paul Davies and all that, Frank Close, all that lot; and Alan – Alan did the physical setup of the museum. I was furious when they took that museum apart, that Dutch professor who was chair of the department.

You talking about Jesper Munch?

Yes. Munch.

Danish, I think.

Danish, is he? I was furious. I know they kept a record of everything that was there – – –. For example, Kerr Grant collected australites, right? And I had them

there. Now, australites, they're incredible things. I've got in my bedroom one about this big, and it didn't come in spinning; it came in straight. And I spoke to all sorts of people. When you look at it, when these astronauts wanted to re-enter the atmosphere, there was a whole lot of bruhaha about the heat shield. My astraloid has got a heat shield, as it came in, it generated. And I said, 'Look, go to the astraloids and you'll get the shape of the heat shield. It's not elliptical, it's not hyperbolic, it's pragmatic. There it is.' And oh, no, they didn't want that. Anyway, Alan Ewart. Alan Ewart was superb. I don't know whether he's still alive. I must ring Maxine. He's really quite sick. He's got sugar[?]. You been to their place?

No.

It's down out the back of Belair. Beautiful property. It's got a creek running through it. I don't know if Alan could, even if he were alive, if he could walk through it. But in those photographs there's Alan and Maxine. She helped me with the visiting lecturers. In fact, I've got the video of the Bragg Centenary, and she introduced, I think it was, Paul Davies. Don Stranks was still alive, he was Vice-Chancellor and chaired the meetings. I sat there with Sir Mark Oliphant.

You mentioned Tony Thomas. He's another one of the Elder Professors.

Yes.

Did you want to say any more about Tony's role in – – –?

He is *the* Elder Professor.

***The* Elder Professor.**

Yes. Yes, I remember Tony Thomas when he came to us. I don't know – well, yes, I will say this. You can edit stuff if you want to, can't you. I was on the council appointment committee for that chair when it was advertised, and the shortlist came down to two. Have I told you this?

No.

Shortlist was Tony Thomas and – who do you reckon?

I have no idea.

Rod Crewther.

Is that right?

Tony Thomas and Rod Crewther, and Tony got up. And I think I have told you at the – yes, that the interviewing process – or while the committee was talking about it up in the council room, nothing had been said about what honours classification he had. I don't think I said this on the record.

No.

And Ian McCarthy was there, he was still alive and Chair of Physics, came from Adelaide, was at Flinders. And he said, 'Well, a bit like the laws of thermodynamics. He was so good that he got the zeroth classification.' (laughter) Which brought the house down.

And I think I mentioned this to you on passing: when Tony went off to the United States, people in Adelaide wanted the Elder Chair to devolve onto people here, and I persuaded the council to allow Tony Thomas to keep the Elder Chair of Physics in the University of Adelaide because it would be more interest and influential in the United States if he would have it and there actively engaged in research be more – anyway, that's what happened, and he still is the Elder Chair, the Elder Chair of – yes. It started with Bragg, that he was the first chair of mathematics and experimental physics – the first and only chair, Bragg. It's now just the Elder Chair of Physics – isn't it?

Yes. There is a separate – there are a number of Elder Chairs, but one of them is Physics.

Yes. There's Elder Chair of Music, Mathematics, Physics – yes, there we go.

Well, Harry, we've been going a good while. We need to come to a stop. Is there anything else we should have talked about?

I don't know if it relates to the past, except that I would hope that academic collegiality would continue to prevail and that the essentially research nature of

universities would continue and be promoted. And I'm very interested to hear how many professors there are these days – all over the place. And Bob Vincent was telling me that he's a professor and he's part-time, isn't he?

Yes, several of them have gone part-time now. Well, I think perhaps we could end there, Harry. Thank you for an interesting conversation.

Well, thank you.

END OF INTERVIEW