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AN ORAL HISTORY OF BRITISH SCIENCE

Dr Mary Almond

Interviewed by Dr Paul Merchant

C1379/38

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**National Life Stories**

**Interview Summary Sheet**

**Title Page**

**Ref no:** C1379/38

**Collection title:** An Oral History of British Science

**Interviewee's surname:** Almond

**Title:** Dr

**Interviewee's forename:** Mary

**Sex:** Female

**Occupation:** Physicist

**Date and place of birth:** 2<sup>nd</sup> January 1928;  
Manchester

**Mother's occupation:** /

**Father's occupation:** Salesman/business owner

**Dates of recording, Compact flash cards used, tracks (from – to):**

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**Name of interviewer:** Dr Paul Merchant

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**Recording format :** WAV 24 bit 48kHz

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**Mono or stereo:** Stereo

**Total Duration:** 4:22:02

**Additional material:** 1 scan of group photograph, University of Manchester

**Copyright /Clearance:** One short section in track 1 [01:24:59 – 1:25:11] closed.  
Track 5 closed pending MI5 approval.

**Interviewer's comments:**

**Track 1**

*Could I start by asking today when and where you were born please?*

In Manchester, 2<sup>nd</sup> of the first 1928.

*And could you tell me something of your mother's life as you – as you know it or if she's – from stories from her?*

Well as I said, she was intelligent and she started a Latin degree at Manchester University, but unfortunately her mother died leaving two young boys and my mother gave up her education in order to look after them.

*Where did she live your mother?*

When I knew them they were living in Gorton, Manchester.

*Hmm.*

I don't know if she was there as a child to be honest. Probably.

*And do you know –*

Yes, I think she was actually because she went to school there, hmm.

*So you think that your mother might have been brought up in Gorton?*

Yeah.

*Manchester?*

Hmm.

[1.22]

*What do you know of your maternal grandparents, of their – of their lives?*

Oh her father ... he was taken on as an errand boy at some firm in Manchester and rose to be one of the managers ... without any education, serious education at all. I don't know anything – well you know –

*Do you know how they met? Your –*

Grand –

*Maternal grandparents?*

My grandparents, I'm talking about mother's –

*Yes, your grandparents, yeah, on the – on your mother's side?*

On the golf course I think [both laugh].

*And –*

No, that's my mother isn't it, yeah, sorry, I'm going back along the generation [laughs].

*No, it's okay.*

That's my mother. Not – not my grandparent – I've no idea how they met.

[2.23]

*And can you tell me something about your father's life?*

Yes, he – his father had a ... firm that made paper bags and that sort of thing and he worked as a commercial traveller going round and selling these bags. My theory

recently is that my father probably was dyslexic, nobody at the time of course would be aware of that sort of thing, but he never could spell and my son was dyslexic and it is inherited. So my father did very badly at school and became a commercial traveller, although from his hobbies and the things he did he was obviously highly intelligent.

*What were those hobbies that made you think that?*

Oh keeping tropical fish, a lot of photography, he had his – made his own darkroom, he enlarged and, you know, then – his photographs into – and oh golf and billiards and [laughs] things. Very – he led a very active life.

*And you think that your mother and father met through golf?*

Probably, yes [both laugh]. I don't think she was any good but I think that ...

[3.57]

*Now I think that you hinted earlier that you might have visited your maternal grandparents because you – you said that you might have been to their house at Gorton, is that right?*

Oh yes, we used to go regularly for a meal once a week at one time.

*Hmm, are you able to tell me anything about your maternal grandparents as people then, as you experienced them on those visits?*

Well grandmother had died long ago. And yes, no my grandfather was fine, yes, he – I used to go and stay with them, his daughter – my mother's elder sister didn't get married and she lived with him, looked after him, and I used to go and stay with them and go for walks with my grandparent – grandfather.

*Do you remember where you went?*

Yes, hmm, what's the park called there, Debdale Park is it? Opposite Hyde Road.

*Do you have memories of their house, would you be able to describe their – their house for us – or his – sorry his house, your grandfather?*

It was on the main road, three storeys ... still there if you want to go and see it  
[laughs].

*This is asking quite a lot in terms of memory but do you have memories of the interior, the sort of – could you give us a sort of tour of the interior of that house?*

Not really.

*Hmm.*

Hmm, big living room at the front, kitchen at the back, a smaller living area I think along the side somewhere, various bedrooms upstairs and I – as I say there was three storeys so there were some higher up as well. Oh I think there was – yes there was a billiard table on the top floor.

[5.55]

*And did you also visit your paternal grandparents, your –*

Oh yes.

*Your father?*

Yes. They lived – when I knew them they lived in West Didsbury. Yes, I was quite ... he had a – well he had two sisters, it was the younger sister who looked after me a lot when I was young, she worked in a bank, I think she was quite professional.

*Do you remember any experiences with the – with the paternal grandparents in the same way you mentioned the walks and the maternal grandfather, any experiences with the paternal grandparents?*

Used to take me – she used to drive and take me out in the car and ... don't remember anything in particular though I'm afraid.

*Okay.*

It's a long time ago.

*Yes of course, of course [both laugh].*

[6.55]

*Now taking I suppose the – the period of time including primary school, so when you were a fairly young child, could you talk about time spent with your mother specifically, so as a relatively young child?*

Er, when I first started school the only one – oh she – she wanted me to go a private school and the only one was about a mile's walk away, which I went to for about a term. And then somebody opened a house in a bungalow just across the road from us, she was called Miss White and school was called Llanoor and I went there for – she had another – other teachers helping her, it was ... okay.

*What do you – what do you remember of the teaching there, we'll come back to time spent with your mother.*

Oh Miss White was good ... my mother didn't want me evacuated. War had started around this time, er, just when – I was supposed to leave Llanoor and go onto a secondary education but the – the school was evacuated and my mother – if – if I'd been evacuated she would have had to take evacuees, which seemed a bit silly [laughs]. So she – I was kept at home and I went back to Llanoor then, even though I was eleven plus, but yeah, they must have taught me alright [laughs].

*So you continued there after the age at which you'd normally have gone there.*

Yeah, hmm.

*Because the war was on?*

Yeah.

*And as a young child what do you remember of, erm, things done with your mother, places gone with your mother?*

Shopping ... shopping in Manchester to buy clothes ... can't think of much else.

*Did you go further than Manchester, did you –*

We went on holiday as a family, usually with her brother and his family. She had two brothers.

*And in terms – in terms of those holidays do you remember significant places or landscapes that were important to you as a child or that you liked as a child?*

I know where we went and [dog barking] – I think that was somebody knocking at the door wasn't it [leaves to check door].

*Yes, you were just talking about memories of holiday landscapes as a child?*

Yes, er, as I say we went to Amlwch on Anglesey, hmmm, stayed in a big fairly modern house in the cliff where you could walk and there was a small beach down some steps where we used to go swimming, it was very nice. Hmmm ... we used to go shopping in the Amlwch village, what ...

*And at this time as a child with your mother do you remember particular conversations with her or things talked about or ...?*

No.

*I know that you've – you've said that she was intelligent but – and I'll ask you again about – later about the reasons why she had to give up her education, but I wondered whether she shared books with you, whether you remember reading with her?*

No.

*No. Do you remember then what she said about her – her background because you – off the recording you said that the – the reasons why she wanted you to have a very good education are because she had to give up hers.*

I think that's true.

*Could – do you remember specifically what she said about her – her past and her history in that respect?*

... Not really ... she said her father blamed himself for the fact that she'd given up. But I can't – don't really remember much.

*Blamed himself because she'd had to take on the brothers?*

[11.55]

Yeah.

*To look after the brothers.*

Yes, hmm.

*Yes. At what age was she when she left school?*

Well it was university so her – she was in the course of her second year.

*And where was she studying?*

Manchester University.

*Latin at Manchester?*

Latin, hmm, I believe, yeah.

*Hmm.*

[12.23]

*Was there any evidence of her interest in Latin to you as a child?*

Yes, she [laughs] used to do my homework, I never did it [both laugh].

*So this is homework that was given by Llanoor.*

In Latin [laughs].

*Over the –*

Oh no, and at Withington as well, she did all my homework [both laugh], I did the maths and the physics, that's why I could do those 'cause she couldn't.

*And what did she – what did she say to you about the importance or otherwise of education, about the –*

It was just implied I think, it wasn't – I don't think she said anything. But she – I mean she was delighted when you know when my sister and I both got PhDs and she was tremendously proud of that. Although she'd – you know, for one reason or another she hadn't managed to achieve anything herself, but as I say she was extremely proud of us.

*Was there any encouragement of a particular subject at home from either mother or father?*

No, just that she couldn't do the maths and physics and so I had to [laughs].

[13.32]

*And what do you remember of time spent specifically with your father, you've mentioned shopping?*

Oh yes he used – he – as I said he was a commercial traveller, he used to drive all around the area selling paper bags and things and he used to take me with him frequently on – when I was on holiday and you know we'd eat lunch at some restaurant and talk on the way.

*What did he tend to talk to you about, do you have memories of that?*

No. He was nice, I liked my father. I could relax with him in the room, rather – better than when my mother [laughs].

*Why is that do you think?*

No idea [laughs].

*And what do you remember of visiting homes then to sell the – the bags, do you – do you have any specific memories of that?*

He went to shops and bars, I just sat in the car or went shopping or something.

[14.32]

*And what was your sense as a child of the relationship between your parents, what was your impression of it?*

... No quarrels ... hmm, dear ... this is skipping many many years.

*Okay, it's fine.*

Er, my mother had a stroke and couldn't go up and down the stairs at the house they lived in in Gatley so I decided to buy a big house and that – have them live downstairs and I and my children would live upstairs, which we did for a few years. My mother hated I'm afraid the move, although you know I think it was essential because my father was – she – when she couldn't climb her own stairs she insisted on being near the lavatory, which meant that she spent her entire time upstairs and my father was doing everything, going up and down, shopping, cleaning, you know, preparing the food, climbing up the stairs with it, which obviously I thought was unsatisfactory. But she didn't – although – I don't know, she was – she was quite happy about moving into this – the ground floor of this house but, er, she did blame my father for it later and I used to hear her shouting at him, I'm afraid, at night.

*But you had – you don't remember anything similar before –*

No.

*Her stroke?*

No.

*No, so you think it was related to the specific –*

It was the stroke, yes.

*Yeah.*

[16.42]

*Could you describe your – your first family home then, the one which was opposite the Llanoor School?*

Yeah, Gatley, hmm.

*Gat – yes, perhaps –*

Still there I think.

*Could you take us on a tour, sort of from the front door and take us around the house and describe what you remember in your mind's eye.*

It was a three bedroomed semi-detached ... go in through the front door there was the dining room on your right, er, further along on the right there was a big lounge and I think the kitchen was on the left, as far as I remember. And there were three bedrooms upstairs.

*And your –*

Oh yes, that's right, my parents to start with slept in the big master bedroom but it was very cold in winter so in the end I used that one and they slept in the smaller one at the back [laughs] and my sister had the other small one at the back.

*And do you have any memories of how it was decorated or of particular objects in it?*

No. I remember the – I mean this was war time, we had an air raid shelter dug in the garden and so that was like a room with, you know, with concrete walls, steps down, electric light, and when the siren went almost every night we used to retreat down there and we could make cups of tea and have the light on and read and-

*What are – what was the –*

And my sister and I had bunk beds down there.

*While we're speaking about this then what other sights and sounds of war do you remember from this vantage point in Gatley?*

Oh, I saw an enemy plane come down in flames and there was a lot of – oh and I remember the blitz on Manchester, the sky all completely red and I can remember the different engine noises of German planes and British planes, the German ones sort of had a beat which British ones didn't.

*What did your parents say about the war at this time?*

... Don't remember [laughs]. I mean they didn't join the – play any part or want to play any part. Oh I tell you what, we had an airman billeted on us, 'cause we were quite near Ringway Airport and that, yes he – he was alright, quite friendly.

*Did he tell you about his experiences?*

No.

*And you've described the sights and sounds of war but how did you feel about the war going on around you as a child, what were your feelings about it?*

[Laughs] Don't know, made life more interesting I suppose ... occasionally the siren went when we were at schools, I was at Withington then and one of the corridors was you know made into a special air raid shelter and we all retreated into there when the siren went ... we – but they were mostly at night, there were very few air raids during the day.

[20.45]

*And when you weren't shopping with your mother or on visits with your father selling paper bags how did you entertain yourself?*

I had friends who lived nearby and, you know, we were out and about a lot. I think parents didn't guard their children so much in those days as they tend to now. I had the run of the roads really, of the people's houses and gardens.

*What did you do with that freedom then in roads and gardens, what did you – do you remember what you played at?*

... I can't really remember [laughs]. Hmm, I can't remember ... I remember the names of the main girls I played with, Pauline Deacroft and Betty something. No, I don't remember what we played at.

*Were there significant toys or books that you remember having?*

Bicycles [pause].

*And places in the locality that you might have cycled to, were there –*

[22.23]

Oh my father used to take me cycling, yes, we used to go all over in and around the airport and Heald Green and around there, yes. Went cycling with my father a lot.

*Did your father have any specific interest in landscape or place that he would talk about or –*

No.

*Show you, this was –*

Don't think so.

*It was the cycling itself. Thank you.*

[22.53]

*And Withington School, when did you start at Withington School, presumably after the war?*

After the war, yes ... I only missed about a year due to that, going back to the other school.

*Yes, and could you tell me what you remember of the teaching of, let's start with science at Withington School.*

Well Miss Verity was excellent [laughs]. And she got an MBE later in – absolutely excellent.

*Miss Verity?*

Hmm.

*And she taught all –*

Physics.

*Physics. Now could you start by saying why – why you describe her as excellent before we – before I ask you about the teaching itself, why do you have a memory of her as excellent?*

I enjoyed her lessons so much. Actually I enjoyed the maths up to GCSE, we had a very strict old fashioned sort of maths teacher who expected us to, you know, write everything out perfectly, which I was good at, which probably helped me in the early programming, so I did, I got on very well with her. Later on Miss Verity was extremely helpful to me and my friend. I mean when we were applying to universities we had evening classes at her house, er, and when we were at the university – during the vacation we helped at Jodrell Bank [laughs] my friend and I, and she lent us her cara – yes, her caravan to live in ... for the two weeks we were there. I used to visit ... later on when I moved back to Manchester I did used to visit her quite often after

she'd retired, and my daughter got to know her quite recently, I mean she – she's died recently – since then but since my daughter was a physics teacher she knew Miss Verity.

*What do you remember specifically of Miss Verity's physics classes at Withington School?*

[Pause] Nothing special really ...

*It may be that – now for you obviously what – what a physics class is is sort of – you might assume that other people know what is taught in a physics class but – so in – you may have memories of it that seem unremarkable to you because they seem just what physics is, you know, what a physics class is, but for some listeners they won't have had specific teaching in physics necessarily with modern combined sciences and they may not have any idea what might have taken place in a physics class at this time, so any – any memories you have – you have about how Miss Verity taught physics or what you did or what she showed would be interesting I think.*

I can't remember. Sorry.

So you –

It's a long time ago.

*You have a memory of her being good – of being good at –*

Yes, and lots of experiments and things that we did, great fun.

*Hmm. Is it a general memory that you did experiments or do you remember particular experiments?*

I don't.

*No. And you said that you had evening classes with her, was that –*

Oh after school classes, yeah, just when we were about to go to university.

*And these were in her home.*

Yeah.

*Do you remember her home?*

Yes, very well.

*Can you describe it?*

It was opposite Withington Girls' School, was a – an ordinary semi-detached sort of house. She lived with her sister, her sister taught driving at, er, in one of the places in Manchester, 'cause I had some driving lessons with her.

*How did Miss Verity's house inside for example differ from your own?*

Rooms were smaller [laughs].

*And do you remember anything about its particular decoration or of objects she had or –*

I know she read *The Guardian*, which my parents didn't [laughs].

*And did you at any point, maybe not at this time but at some point, get any sense of her background, how she ended up being a physics teacher?*

No, I didn't, no. It would be interesting to know that because, you know, she was a generation before me when it must have been very unusual to have girls that were doing physics, hmm, no I don't.

*You've mentioned also the maths teacher at Withington School.*

Oh yes.

*What do you remember of other – the teaching of other subjects?*

... Hmm ... I knew – hmmm, our war effort was picking peas at a farm near Wigan and some of the teachers went with us there and when we cooked our own food and lived in army bell tents and ... and so I got to know those teachers quite well but I – I don't – don't think they taught me. And I don't ... there was a French teacher I should remember but not really. Art, Miss Benson did art, but I wasn't any good at art, or French [laughs].

*What made you think that you weren't good at art?*

The marks I got I suppose.

*And do you remember how – do you remember how you knew that you were good at physics, or how you knew that you were good at maths?*

Marks I got, things the teacher said.

[29.56]

*And I've left these questions to sort of set – we've got to sort of secondary school and I wondered whether you had a sense at this time of your parents' political engagement, their – their politics really?*

Oh the – they were small business people so they were Conservatives.

*And how was that expressed, how did you know that at the time by what they said or did?*

Critical of socialist ideas ... and the working class people too which was bit incomprehensible to me now, they blamed working class people for being badly off I think, for some reason. I think they did in those days.

*What was their sense of their own class then if they were critical of –*

Oh ... very middle I think.

*And do you remember what they said about –*

I mean there were some children living at the end of the road, I was told not to talk to them because of – you know, they were poor and [laughs] ...

*And you said they were critical of communist ideas.*

Oh they would have been.

*Ah, you don't remember them saying anything in particular, this –*

Well I don't – were there communists available – around at that time?

*Well socialist sorry, socialist ideas.*

Socialist, hmm-hmm.

*What paper did they take, you said it wasn't The Guardian?*

Hmm ... what would it be, I don't know, *Daily Mail* probably, something like that.

[31.50]

*And their religious views, if any?*

Oh my – my mother’s family were Unitarian, her cousin I think it was was a – a preacher, Unitarian. Which, of course, a sort of free thinking sort of religion isn’t it, it is Christian but ...

*And your father, his – his views?*

Oh I doubt if he was very interested to be honest, more interested in golf and [laughs] – but, you know, he would have said he was Church of England I think.

*Did you go to church as a child?*

Oh there’s a story. Hmmm ... I got friendly with the girl next door and her father used to walk her and me to Northenden, which was a mile or so away, to attend a church there. And I don’t know, I think partly to annoy my parents ... I got very enthusiastic about being a Christian at one time. The parson’s wife, Mrs Allan was very friendly and we used to hold garden parties and hold sewing classes and things like that at her house. And I got to know her well.

*What – what appealed to you about the idea of believing or being a Christian at that time?*

... Partly ‘cause – just ‘cause my parents didn’t I think [laughs].

*And being a Christian at this time, did it involve weekly visits to the church?*

Yes, hmm-hmm.

*With your friend that you’d made, your neighbour?*

Yes, and her father, yes. Jean she was called, Jean Uncles

*When did that come to an end, as you – I think you implied it did?*

Probably when I went to Withington, I don't know, would it be? No, later than that I think ... can't remember.

*So you were doing this while you were at Withington you think, while you were at secondary school?*

Yes. 'Cause I did – was it called scripture, O level, mainly 'cause it was an easy subject to get a good grade in [both laugh], yeah, I think so.

*And could you tell me about relations with your sister?*

[35.11]

Oh excellent and we still are. We went on holiday together a short time ago and we phone each other regularly.

*And did she go to both of the schools that you went to?*

Yeah.

*And sorry I've missed – I've forgotten or missed how – was she younger or older?*

Younger, five years. Quite a lot younger I think, about five years younger, hmm.

*Would you be able to tell me about – you did O levels and then about specifically the teaching for A levels and I'll need to know which A levels that you took?*

Pure and applied and physics I think. Oh I did chemistry subsid in those days.

*So pure maths, applied maths, physics and subsid chemistry?*

Yeah.

*Do you remember anything specific about the teacher of any of those areas at A level, teachers or lessons or practicals or ideas?*

I didn't get on as well with those two maths teachers as I had with the – going up to O level. And ... I don't know. I'm not a brilliant mathematician to be honest and I think they realised that [laughs]. My sister got on – she's got a maths degree, she got on much better with them when she went to it.

*What did you find – why do you say that you didn't get on with them as well as you had the previous one, how was that manifest – what –*

I don't know, Miss Gearing was very complimentary ... and she'd ask the class some question and nobody was responding so she said, 'You tell them Mary,' [laughs], I don't –

*This was the previous maths teacher?*

Yeah [laughs].

*So she was a – a female teacher, this was –*

Oh it was – they all were at Withington, yeah.

*Ah even at – even at A level?*

Yes, all, this was at O level, she was quite an elderly woman, Miss Gearing, traditional sort of maths teacher.

[37.37]

*And how popular within the school as A levels were maths and physics and chemistry? What was the relative popularity of them as subjects for A level?*

I don't know to be honest ...

*Do you have any memory of the sort of size of the classes?*

Oh there were only three or four of us I think ... I can't remember, yeah, I think.

*And what was Miss Verity's role at this stage, still physics teacher, A level?*

Yeah yeah. And she taught at other – other levels as well.

*And could you say something about the – the decisions made in the school and the home, discussions about what to do next, what to do after A levels?*

I think it was – it was always assumed I would go to the university. I only applied to Manchester I think, and some other close-by one I think, I can't remember which. Of course I got into Manchester.

*What did you apply for?*

Physics.

*And you mentioned earlier that Miss Verity was helpful in this process?*

Yes, oh she was, yes yes.

*Could you say how –*

Well we had these extra lessons at her house.

*For what reason, to prepare for entrance exams or to prepare for A levels or –*

To prepare for A levels I think. I think – I don't think there was a particular entrance exam, we just probably were admitted based on our A levels.

*What did you get for A level, do you remember your grades?*

[Laughs] It's probably on that [both laugh].

*Let's have a look. [Looking through papers].*

No it isn't is it ... no. No, I don't remember.

*But you got in at Manchester to read –*

Physics.

*Physics, what – what year did you join?*

That'll be on there [laughs].

*Ah. [Reading papers]. We've got 1949 –*

Yeah.

*Is that the graduation date rather than the joining?*

No no, I think that's when I joined isn't it? Yeah, that's when I joined.

*Okay, 1949.*

Yeah ...

[40.15]

*Where did you live while studying physics?*

Home, that was normal in those days, I mean almost everybody lived at home, unlike they do now.

*Hmm. And what do you remember of the first year of teaching of physics at Manchester?*

Blackett taught us and Professor Lovell, and towards the end of the year Lovell – he just – oh ... he'd been working on radar during the war and he'd noticed these echoes that he thought might be meteors or cosmic rays and he wanted to study them and he tried at Manchester University but there was too much interference and the botany people had this station at Jodrell Bank and he decided to move out there. So at the end of our first year he asked the class if any of the boys would – would be interested in spending some time sort of digging trenches and mixing concrete and the other tasks that they needed at Jodrell. After the lecture I went to see him and said, 'Would there be anything for girls to do at Jodrell?' [laughs] and he said yes he was sure he could find us something. So my friend and I spent two weeks working in Jodrell Bank, living in Miss Verity's caravan as I said, and we sandpapered rust off an old army search light that they were going to attach an aerial to.

*And the boys were there –*

Digging.

*Doing –*

Mixing concrete and digging trenches [laughs].

*Any other girls aside from you and your friend there sandpapering?*

No no.

*No other girls at Jodrell Bank?*

No, there were another couple in the first year physics I think, two or three, but no they didn't do things like that [laughs].

*And apart from obviously seeing the searchlight that you're sandpapering and the boys digging, what – what did you see happening around you at Jodrell Bank in terms of its –*

Mud [laughs], hmm. Oh yes I tell you what, might have been later, an astronomer called Prentice, yeah, probably was a ... used to come and – at night and sit in his deckchair and look for meteors and when he saw one he would shout, 'There's one, did you see it?' and other people were looking at the radar screen inside the wooden hut. Or trailer, or ex-army trailers I think they were. And so we were correlating the echoes with the meteors.

*Where were you in relation to the deckchair and the huts with the radar in this caravan?*

I was probably in the caravan actually.

*In the grounds of – instead – perhaps –*

Yeah, Jodrell Bank was at that stage had no permanent buildings for the – the physics people and that we were just in these old army trailers in a sea of mud.

*And Miss Verity had leant you her caravan.*

Oh yes that was a few miles away actually we used to cycle there, that was at Alderley Edge.

*Was this a sort of static caravan that she just happened to –*

One for the – for the summer I think.

*And then you and your friend cycled to Jodrell Bank?*

Hmm, yeah.

*And – and did you stay in the huts while you were working there or did you cycle back at night to the ...?*

We cycled back at night. At that stage, we were there again the following year in which – and then she lent us a tent and we actually camped at Jodrell ... along with several boys. Main thing I can remember from that is buying a – a chicken from the local farmer and cooking it over an open fire [laughs].

*What were you doing in terms of –*

I can't remember what I was doing, something more sensible than sandpapering, hmmm, I don't know, really some –

*What – what were you – you yourself doing in terms of sky watching or meteor watching, were you involved in that at that stage, did you take part in –*

Well only as a matter of interest, not seriously.

*And what did you see in terms of the construction of Jodrell Bank happening around you over that first and second year?*

Nothing much was happening I think.

*So it was still huts in the mud?*

Yeah yeah, and well they attached an aerial to the searchlight that we'd been sandpapering and used that. Later on there was a great big parabolic aerial, fixed one, not – not like the – the one they've got now but, er, they used to receive signals from further away.

[46.02]

*And could you tell me about the relation with your friend, how – the friendship with your friend who joined you at Jodrell Bank, how it started and why you were –*

Oh at school, we were at school together.

*Oh this was this – oh this was this –*

Marjorie, hmm.

*Yeah, so she'd done A levels at the same time and also applied to –*

Yeah yeah.

*Could you tell me about that particular friendship, about things done together aside from –*

Everything [laughs]. Oh fruit picking, hiking, youth hostelling holidays.

*Do you remember having conversations with her about science, about the fact that you were both studying science?*

[Laughs] No, not really. Erm, it was a big army ... you know ... the physics course at Manchester grew enormously the year we started because there were a lot of ex-servicemen and it grew from, you know, twenty to 100, nearly all male, a bit older than us. And some of them were excellent at social life, among other things we used to go hiking and youth hostelling holidays with this gang of young men. I've – somewhere I've got some old photographs but goodness knows where they are [laughs].

*So you went youth hostelling and cyc – and – and hiking with other undergraduates in physics, the –*

Yeah.

*Yeah ... and on this first year physics course there was you and your friend?*

Yeah.

*What – other girls on the –*

Yes, a couple of others I think. One from our school but she – Sybil Ellerby, but we weren't – she wasn't sort of part of our gang and there was I think two from other places. But that's all, hundreds of men.

*And did your – did the fact that you were two or three or four girls on a – on a course that was dominated by male students, did that draw comment from the male students in any way?*

I don't think it did, I mean my memory of university is that, you know, women were treated like men, always.

[48.43]

*And what did being treated by like mean on a physics course?*

Well [laughs], you know, what they did we did.

*What did you do in the first year of physics in terms of the teaching of it? I'll break – you've mentioned, hmmm, Lovell –*

The books are there [laughs].

*Yes [both laugh], you've mentioned Lovell and Blackett so can we do – could – what do you remember of Lovell's teaching, it doesn't matter how little you remember but any – any mem –*

He read it from a book because he was spending all his nights out at Jodrell Bank, so he didn't prepare it very well, he – if you got the right book you could tell which page he was on [laughs] I'm afraid.

*And he was reading books in astronomy, is that what he was teaching or physics more widely?*

Er ... it wasn't astronomy, probably there somewhere. Hmm ... Blackett taught properties of matter ... gyroscopes and things. I can't remember what Lovell taught ... no ... probably atomic physics or something like that, I think as – as much as they knew in those days of course. I think that's what it was.

[50.25]

*What do you remember of him personally as a man?*

Yeah, he was alright. He wanted me to go to Jodrell Bank when I graduated and he said I was very good. And ... what I'd – if you're interested in what I did there ... we were finding the orbits of meteors and something else – all the hard work was done by other people. Hmm, some of them had set up the radar equipment to find where in the sky the meteor shower was originating, somebody else called Herlofsen worked out how to calculate the speed by using the diffraction pattern as they went through the beam. And somebody called Porter, I think it was, at Herstmonceux Castle, the Astronomer Royal, had been using the radiant and the velocity to calculate the orbits of comets. So they sent me down to Herstmonceux Castle for a couple of weeks to learn his method and came back and applied it to the – you know the average velocities and average radiant points that we got for our meteor showers. It was a lengthy calculation that would have been ideal for a computer but there weren't any. Er, first of all I used a Brunsviga, one of those [laughs] – I don't know if you've ever –

*No, if you could – what – can you describe those, what is that, what's a Brunsviga?*

Mechanical calculating device where you keep – if you want to multiply by nine you turn the handle nine times [laughs] and later on they bought me an electric calculator, but you know, it would have been an ideal programming exercise if programs had been available. Anyway I calculated, and my PhD is here somewhere, calculated the orbits of all the well known meteor showers and also at Jodrell we discovered some

during the daytime that ordinary astronomy – you know, traditional astronomers hadn't realised, so found their orbits. We also did a lot of experiments to prove that meteors belong to the solar system, 'cause in those days people thought they were visitors from outer space but we convinced ourselves that they were definitely part of the solar system.

*This work that you're describing, is this research work that happened immediately after your degree?*

Yeah.

*So at the end of your degree what – as you've – you've spoken about this now we'll cover it now, you finished your physics degree at Manchester.*

Got a – yes, got a 2:1 which entitled me to a grant to do research, Blackett decided I was going to Jodrell, which I was quite happy about. And I used to cycle out there which was a long way [laughs].

*Cycle from your home in Manchester?*

Gatley, hmm-hmm.

*I'm going to come back to that after we've finished with Manchester. But just –*

[54.40]

*So this bit is coherent there's one thing that I didn't understand in what you said and that's when you talked about radiant points, what does that mean when you –*

Oh where ... the meteor stream – stream appears to originate from, where there's some point in the sky.

*Okay.*

They had – they built special aerials at Jodrell to determine the radiant points ...

*And so you started at Jodrell Bank then in '52?*

'52, yeah, '52.

*Yeah ... ah on here we've got '49 to '52, research assistant Jodrell Bank so –*

Oh sorry.

*Do we think that perhaps this 1949 – oh yes, look, started Manchester '46, graduated '49 I see, so you started at Manchester in '46 and graduated in '49?*

Yeah.

*Which means you started at Jodrell Bank in '49.*

In '49, that's it.

*I see, thank you. We'll just – we'll just go back to Manchester University.*

Hmm-hmm.

[55.52]

*Physics and finish that and then we'll come back to Jodrell Bank. Could you describe the – the lectures of – of Blackett at – in – at Manchester in physics?*

I know he talked about gyroscopes. Hmm ... not really ... probably got my lecture notes down there [laughs], hmmm, if you really want to, I don't know.

*You've – you've kindly got out a series of notebooks which have got notes on your –*

Some of my courses.

*Some of your courses in physics over the three years and one of them is one notebook on geophysics which you think was taught by ...*

Keith Runcorn.

*Keith Runcorn.*

Yeah.

*What do you remember of him as a person, as a lecturer at the time? I don't know the, the appearance of him for a – would be a start, the way he taught, do you have memories of that?*

No, he was perfectly efficient ...

*What clubs did you join at university?*

None.

*No clubs and societies?*

No. I mean we just went hiking and youth hostelling with the people on the course.

*And was this a – was this the same group of friends over the three years?*

Yeah.

*And were there any significant relationships within this –*

[57.44]

Oh Marjorie – Marjorie married one of the boys.

*Marjorie is your friend from school?*

Yeah, she – they're still married.

*Hmm. And did you have any particular boyfriends over this university period?*

No not really, no, I was very fond of one of the older boys but – oh I've lost my thing, do you want it on?

*Oh yes please.*

But, you know, couldn't call it a romantic attachment ... [reattaching microphone]. I mean I got married when I was at Jodrell Bank didn't I, while I was at Jodrell Bank.

*Okay, we'll – we'll come onto Jodrell in a second, you – you can – and you stayed at home throughout the three years that you were –*

Yeah.

[58.40]

*Yes, do you have particular – could you describe any – any one of the holidays if – if that's what you called them, you took hiking or youth hostelling, do you have a memory of perhaps a particular one of those that you could describe in terms of the things that you did?*

Not really ... oh.

*Where did you go in –*

Except the rainbow, this is –

*Oh yes.*

[Laughs] Well the party had split up, there were a few people walking ahead of me and they came to the top of a hill and there was this large rain – you know, a rainbow, double rainbow, and they were discussing the physics of it. I came up with my friends and I looked at it and said, ‘Oh isn’t it pretty,’ and they just laughed [laughs]. Oh not being scientific at all. I don’t remember anything else.

*Was this youth hostelling in Britain or did you –*

Oh no we did go abroad, erm, after we graduated we went to France and Italy, oh climbed a – climbed a mountain. Or Ray, Neate and I did. And I rescued him ‘cause he fell over the edge. Yeah, we ... yeah we – quite a gang of us went as I say to France and Italy, staying at youth hostels.

*And what was your parents view of a) you camping at Jodrell Bank and with this group of mainly male students, but also just you with your female friend but – and then of you on these youth hostelling holidays in a mixed group?*

Yes, well ... they were very upset when my whole – I did for a while have the relationship with one of the research students at Jodrell Bank and he was studying something that involved him going out at night to check on his equipment and my mother was furious when she learnt I’d been out to Jodrell Bank with him at night, ‘cause she suspected the worse, which of course hadn’t happened at all. But ... no I don’t think they minded the – the ones we went walking and hostelling with. I mean there were always a lot of us together and – and – and she’d met some of them.

[1.01.46]

*When you reached the end of your course in physics at Manchester and were thinking about careers.*

I wasn’t.

*Ah, you weren’t?*

[Laughs].

*What – what were your – what were your hopes then for the future at the – in your third year of physics at Manchester let's say?*

Well, to do a PhD.

*Had you a particular area of physics that you would at that point have preferred to do?*

Well everybody assumed I was going to Jodrell Bank and that's where I'd been interested.

*Because of these two summers helping?*

Yeah, hmm ...

[1.02.37]

*Could we look then at this move from Manchester to Jodrell Bank, and for people who have never been to Jodrell Bank and know nothing of its history could you describe at the end of your third year at Manchester what there was at Jodrell Ban. So you joined Jodrell Bank as a research assistant doing a PhD, but at that stage could you describe what Jodrell Bank was, what was there?*

I think – oh dear, I think they'd built the huts and ... when we – the – the two years that we went during our undergraduate course, as I say it was just a muddy field with ex-army trailers but they did build, they made a road around and built a series of sort of prefab huts that we lived in, worked in.

*When you say we who was with you then at this stage, this was –*

Oh other research students and –

*Had your friend –*

Oh she wasn't – she went –

*She went elsewhere?*

Yeah.

*Where did Marjorie go?*

She stayed at Manchester actually for a while but she – she didn't get her PhD, she gave up.

*And so could you describe the particular hut or building that you worked in in 1949 at Jodrell Bank?*

[Pause] Prefabricated ... hmmm, had a door in and lots of equipment ... hmm ...  
[inaud] ... and they were filmed, had a camera that filmed the radar echoes in those days, so my job was to load this camera and each morning sort of take the film out and develop it and then analyse it, sitting at a – you know, cathode ray – big screen and analyse this film ...

*Where was the camera in relation to your hut?*

It was inside it I think, so ... yeah.

*How did it record then the – the radar echoes?*

Well there was a screen.

*So inside the hut you had a screen.*

Yeah.

*And was that connected to the camera, you mentioned – you described taking a film out of a – of the camera and then –*

Well the camera was pointing at the screen. I think ...

*And what did you see on the screen in term – for – for people who don't know anything about this work, what did looking at the screen and analysing the radio echoes entail, what did it look like?*

Straight line along the top and blips going – going down when there was an echo.

*And what were you doing in terms of analysing those ...*

... PhD may be helpful ... [looking for PhD] [pause whilst reading PhD]. Ah yes that was to find the velocity, yeah.

*So we're looking at your PhD thesis –*

Yeah.

*The major meteor streams by Mary Almond and figure one has a – a diagram, this is – is this reproduced from the camera film?*

Hmm.

*Showing meteor echoes showing a diffraction pattern.*

That's right.

*And would this – what would this tell you about the meteor streams, direction?*

How fast it was going.

*How fast, so this was the velocity of them.*

Yes, somebody else was working out the – where it came from. The radiant.

*Who was supervising this work, so having – looking at this – these echoes day to day, who are you reporting to or discussing this with?*

There was a man, somebody there called John Davis who was immediately my superior, and of course Lovell was in charge, John Davis who died like everybody else [laughs].

[1.08.44]

*And can you say something of the other research students at Jodrell Bank at this time, your memories of other –*

Gerald Hawkins was he called ... I wasn't particularly close to any of them. Oh yes there was – there was several – Arnold Aspinall and quite a – four or five or six of us, hmm, doing various jobs. And Vic Hughes was the one that went out at night with briefly ...

*And what was Vic Hughes' equipment that had to be –*

Oh there were –

*Maintained at night, what was he doing?*

[Pause] It was some, er, star that was varying in intensity and they were recording it. Can't remember what it was called now, Sagittarius or something, and [inaud] ... no I don't remember.

*That's okay, and the relative balance of male and female research students at Jodrell Bank, was there –*

Oh I was the only female. Treated like all the males I'd have to say. There were secretaries and – and ...

*You've implied to think that this wasn't remarked upon the fact that you were the only*

–

No no. Why should it be [laughs]?

*And apart – aside from the huts and the perimeter road at Jodrell Bank what else was there there at this time, the prefab huts and the – and the perimeter road was there.*

Yeah, there was this big parabolic area, a fixed one and there were the – oh a set of aerials that found the radiant point and there were two sort of – two banks of those, can't remember much about it. That's all I think. And then, you know, Lovell had the idea of building the – the present one ... and the day he was going to start the farmer put his bull in the field because he didn't want a big aerial there [laughs]. But they managed to get it up. That's in his book but I was actually there when it happened, we all thought it was a great joke [both laugh].

*What do you remember of relations with the farmer, do you remember the farmer?*

Apart from his bull [laughs], not that one, no. I mean the one we got chicken from when we were camping there but he was a different farmer.

*What did – do you remember the – the farmer with the chicken, the farmer from whom you bought the chicken, did he have a view on the – the development here?*

Don't think so ... no, don't know.

*Did you discuss this job with your parents, in other words tell your parents about what you were doing day to day?*

No. No ...

*Because why – why do you think you didn't talk about it?*

Well they wouldn't have understood. Or been interested.

[1.12.43]

*What was the next stage in your – in your work then from – from working as a PhD research student became –*

Yes, I'd actually been interviewed and accepted a job with Ferranti, but then one day Professor Blackett walked into the hut and said that would I like to work for him, and I said yes.

*That was towards the end of your PhD was it?*

Yeah, right at the end.

*Now it seems then at this point that your – your relations with Professor Blackett have – have changed from being a student sitting in a class with someone lecturing at the front about something to being a bit – a bit closer to him in terms of working; what are you able to tell us about him as a – as a person that you think might not have come through in sort of official biographies of him and that sort of thing? So you're your sort of personal view of him as a – as a colleague? And this can go beyond what he's like as a scientist to what his enthusiasms, his interests beyond, if you like.*

There's several books about him, and I just think he was a wonderful person [laughs].

*Why wondering, why – what was wonderful about him?*

Oh his interests and his attitude, very very broad minded, any reas – you know, and I mean the fact that I was a woman didn't make any difference to him, any race, colour, religion, politics, he didn't – wasn't interested. He had communists working for him and a lot – various Indians and so on.

*Was this broad minded attitude that he had unusual then?*

I think it was, yes. I hope I caught it a bit.

*Did you have experience of scientists or other people at this time who didn't share his broad minded –*

Well certainly my parents didn't.

*What were your parents view specifically on then gender equality for example?*

Oh, no they were happy with that, with working as a man

*Racial equality?*

Hmm ... I'd – I mean I – probably not met many people but I suspect they would be a bit intolerant.

*And did you gain any impression of Blackett's interests beyond science in terms of things he did outside of work?*

He'd got a family and his wife was quite a personality too, confined to a wheelchair by the time I knew her, she was quite a strong personality. We knew his daughter quite well and her children played with my children on one – and – oh dear ... they had a house in Wales and Peter Stubbs, who was one of Blackett's people – well his mother also had a cottage in Wales which she used to lend to us. We had two summer holidays there and while we were there Blackett's invited us round for a cup of tea, so his daughter was there with her children and played with my children.

[1.16.52]

*You mentioned earlier that you got married during your time at Jodrell Bank?*

Yes.

*How did you meet your husband?*

He was actually working for Blackett, he was a sort of technician and then ... using the equipment that I used later on, hmmm, but at – well I don't think I used the one at Jodrell Bank, a magnetometer. Hmmm, oh I – Blackett had an idea that there might be a magnetic field near – a solid lump of gold or something, in fact there wasn't but that's what [laughs] Jim was working on.

*What did Jim say, it's quite a famous experiment isn't it where he borrows a block of gold from the Bank of England.*

Yes, Jim cycled out with it in his carrier – in his carrier bag – carrier – cycle carrier.

*You – you remember Jim taking this –*

Block of gold, yeah.

*Were you –*

Because we wanted a wedding ring and we were tempted to hack a bit off [laughs].

*So when – when did this relationship with Jim start?*

... Year or two after I graduated I think.

*And where was he cycling out from in this block of gold in the carrier?*

Wherever he got gold, from somewhere in Manchester, out to Jodrell Bank.

*And so you saw the – did you see the experiment taking place at Jodrell Bank?*

Yeah, I used to go to it, the hut. The non-magnetic hut.

*And what did you see happening there?*

Well, him using a magnetometer.

*So the piece of gold, how was that set up? 'Cause I believe it had to spin, is that right because it was about the – the magnetic field created by something that span, is that –*

Not – I don't remember that, no.

[1.19.00]

*And at this point what did the magnetometer look like, I have absolutely – absolutely no idea what the piece of equipment –*

Oh there was huge hope – hoops of wire to cancel out the earth's field.

*And by huge are you suggesting sort of a metre in diameter?*

Yeah, well a bit more I think.

*Hmm. I'd imagined it was quite a small instrument but this is quite a – so large hoops to cancel out any magnetic field that's coming not from the object you're interested in –*

Yeah.

*And then how does this magnetometer actually focus on the object and measure the –*

Well you have to put it inside the hoops.

*Hmm, so the object goes inside the hoops –*

Hmm.

*And how is it recording the magnetisation of the object?*

Oh a spot of light that you had to watch on a metre scale and you had to see how far it deflected. The – oh I think the – there must have been a mirror attached to something that you were – shone the light on, is that right? I think – and so you got a beam ...

*Was Jim's – Jim's surname was Almond was it or –*

No no, that's my maiden name.

*Ah.*

Pickering.

*What did Jim say about this experiment that was ...*

Don't think he said anything that –

*It ended up being a sort of negative result didn't it by looking –*

Yeah.

*Okay.*

[1.20.57]

*Now you've been asked by Professor Blackett, he's come into the hut and asked whether you – you could have gone to Ferranti but he said, 'Would you like to work for me at Manchester?' do you remember what he said about what the work would involve at this stage?*

No, I don't think he told me much at that stage.

*And then you moved to working at Manchester.*

Yes.

*In – in what sort of working quarters were you at Manchester and what –*

Hmmm ... I think there was a – he had a hut there – he certainly had a magnetometer there, er, and I'm not sure if it was – I think it – I think – I don't know, I remember better when we went to Imperial College. I mean he moved after the first year and there he had a hut in the sort of back – back garden of the college, the Imperial College, a non magnetic one like the one at Jodrell Bank with long magnetic screws and – and ... and I mean I used a magnetometer there to measure – and Peter Stubbs was a geologist and he and I used to go driving round England collecting samples of Triassic rock it was we were interested in at that stage, and he would slice it up and made it – make a – cut a core out of it and then slice it up into discs and I would measure the direction of magnetisation in these discs and we found that England had moved a bit ...

*So in terms of the – the Manchester department that you remember less well.*

Yes, I must have had a magnetometer there somewhere, I don't think it was outside. I think it was in the basement, yeah, I'm pretty sure it was.

*And –*

Of the new physics building. Not the one at – oh ... [laughs], on – on the side of the road where the original Manchester University was.

[1.23.36]

*And who was already working for Blackett on geomagnetism at the time [inaud].*

Oh Clegg, John Clegg who'd been at Jodrell Bank but he went to work for Blackett and then Peter Stubbs.

*Did Peter join at the same time as you or afterwards or before?*

About the same I think.

*About the same time.*

I mean he knew Blackett because of the houses in Wales [laughs]. He's died, John Clegg's died.

*Where had Peter done – where had Peter studied geology?*

I don't know.

*You just know that he was a geologist.*

Yeah.

*And John Clegg –*

His wife's still alive, hmm, still –

*John Clegg was a physicist?*

Yeah.

*Had he studied physics at Manchester?*

He was working for Lovell at first and he designed big – the big aerial.

*The parabolic aerial that you've mentioned?*

Yeah. And – and that he – I think he had a hand in the – the big one, the moveable one.

*What was John Clegg's role in this magnetism group then of Blakett's at Manchester?*

Sort of in charge. He – yes, he – he went collecting rocks as well. [Closed between 01:24:59 – 1:25:11] But he was sort of fading out of the picture I think a bit, at Imperial.

[01.25.20]

*And your visits with Peter at – to collect the samples, did they start – did those visits start to happen in – while you were still in Manchester or after the move to Imperial a year later?*

I think they started in Manchester, hmm.

*What do you – could you describe the field work involved then, where you went, how you collected samples, what –*

No, I don't know if it's in any of the papers, no I can't remember, I'm sorry. Oh we took a big chunk of rock back home.

*How did you know where to go to get the – you know, where –*

Well Peter – relied on Peter.

*Yeah, Peter knew where the exposures were.*

Hmm.

*And you collected – how did you collect the samples, so imagine you got out of the car at a – at a site, how did you get the rock?*

[Laughs] Can't remember, hacked it I think [laughs]. We didn't have any big equipment or anything.

*And then you brought it back to either Manchester or Imperial?*

Yeah, and we had machines there to cut out a core and slice it up. Peter did.

[1.26.31]

*Now you say that you can remember Imperial better than Manchester, could you describe then the – this hut in the grounds of the – of Imperial College?*

Just a hut [laughs], I don't –

*For people who don't know what a non magnetic hut looks like, perhaps it just looks like a hut, I don't know.*

Yes [both laugh], was just one room, yes I think so.

*One room?*

I think so.

*And inside the room you had the –*

One of these big, you know, to cancel out the earth's field again, big hoops of ... well –

*And you said that you had the samples which were discs that –*

Yeah.

*Could you say how large the discs were and –*

Ooh about that long [demonstrates].

*It's about an inch and a half in diameter and how thick were the discs?*

Quarter of an inch perhaps.

*And do you remember in enough detail to you say, you walk into the hut, you're holding a disc, what do you do next in order to say this is the magnetisation of this disc? What did you do when you –*

Put it inside the magnetometer, raised it up to the little magnets there which made the – a light beam on this metre rule thing and see how far that swung.

*And you – how did you record your – you know, the number –*

Wrote it down I think [both laugh].

*And could you give us a sense of how many, er – how many visits to sites in Britain you had to do to get samples, how many measurements you had to take, how long a single measurement would take? I mean I know by –*

I only remember two or three trips with Peter. Hmm ... I took thousands of measurements to be honest [laughs], I mean my life was spent in the hut measuring the deflection of this spot.

*And apart from measuring and recording for each sample, at this stage was an calculation involved, any calculating to get a result, or was it a case of putting in a sample, reading off the measurement and writing it down for that sample and moving onto the next?*

One must have worked out averages and things mustn't we, I can't remember. We did some – Blackett's book ... [looking through Blackett's book]. There you go [laughs], that's the bit I'm most proud of [laughs].

*These – you're pointing here to – to –*

My name ...

Ah.

‘And has found, and that correlated.’

*So this is Lectures on Rock Magnetism by PMS Blackett, 1954. You’re saying the bit that you’re most proud of here is, ‘The scrutiny of these figures shows no marked correlation between any pair of the quantities,’ and the various symbols there, ‘nor is there any obvious correlation with the property of being normally or reversely magnetised, Almond however has found a marked correlation of,’ sorry I’m – ‘a susceptibility that,’*

Mu, whatever Mu is.

*I think it means from this graph susceptibility, ‘A marked correlation of susceptibility with colour, the darker as opposed to redder rocks having the large susceptibility and also low coercive forces’. Do you remember what that means in terms of the [both laugh] wider picture of rock geomagnetism?*

Not really [both laugh]. But I remember telling Blackett about it because I’d been measuring this susceptibility of twenty or thirty of these samples and just for fun I’d arranged them right across my desk in order of susceptibility, going from very pale in colour to very dark [laughs] and when Blackett – I mean he came to see me almost every day and I said, ‘Look at these, they’re in order of susceptibility,’ [laughs] so he – obviously he’d remembered my comment and put it in his book.

*What does susceptibility mean?*

Oh goodness knows [laughs].

*Susceptibility to, erm, becoming magnetised?*

Magnetised, yeah.

[1.32.04]

*Now at about the time that this book comes out, 1954, your group, and I don't know who is the spokesperson for your group because it's not clear from the way that this is written up elsewhere, but you're putting forward your conclusion that Britain has moved north and rotated –*

Kind of tilted a bit hasn't it, yeah?

*Yes, and tilted relative to the – the earth's current axis. Now what do you remember of your role in presenting this conclusion if you were involved in that?*

I wasn't, just did all the donkey work measuring the samples [laughs].

*And what do you remember – being interested in what you were doing of the sort of popular reaction to this finding, I wonder whether –*

Oh I mean a lot of people at that stage didn't believe in continent drift at all, not – I mean nowadays they do don't they, but people didn't.

*Was your group doing these measurements very consciously in relation to the theory of continental drift, did you have a sense that that's – at the time that that's why you were doing it, to test this theory? What did Blackett say about the relationship between this work and the theory of continental drift as far as you remember?*

Whether he said much – but after I had left they went to India and India has supposed to have moved hasn't it, from one side of the equator to the other, so presumably Blackett knew that theory and wanted to test it out.

*What do you remember of relations with the Cambridge group who at this time were also studying the remnant magnetisation of rocks?*

Only – I mean I – I spent the day with Runcorn once just – just – oh and Ted Irving was there wasn't he as well. And ... I – for some reason Blackett thought Runcorn had quarrelled with him, I don't know why [laughs].

*Quarrelled with him over this particular work?*

Hmm.

*Was that why Runcorn had gone to Cambridge?*

I don't – I don't know any details, I just – just an impression I got.

*To what extent was there rivalry between the Imperial group and the Cambridge group?*

That – I wasn't aware of it.

[End of Track 1]

## Track 2

*You've said something about the – the non magnetic hut at Imperial and the magnetometer inside it and the method of recording, what – could you describe the rest of the physics department at that time?*

Really I didn't have much to do with it, I mean ...

*Do you remember other – apart from Blackett do you remember other key academics there at that time?*

No, only our group ... oh but Blackett did take some people – other people beside the rock magnetism group didn't he, he – oh yes Harry Elliot was one, I don't know what he was working on. And he had others as well. Other people from Manchester that had been working with Blackett that went down to Imperial College.

[1.11]

*Now you worked as research assistant at Imperial College between 1953 and November 1954.*

I was pregnant. Deliberately.

*Yes [laughs] okay. And so you left – you left Imperial presumably on maternity leave and –*

Well permanently I think, yeah.

*And could you say what happens next in terms of where you're living and what you're doing day to day?*

I was looking after baby.

*And – and where were you – where were you living at this time?*

Erm ... we've – oh Jim's mother lived in Chester, we moved in with her for a few months and then I bought a very nice little house actually at Helsby on the main road, erm, don't know it you know Helsby? There's a hill you can climb and some nice walks there. And – but then as I say Shell moved us to the housing estate at Stanlow – was it, yes, and then later on they moved us to the one at Shellhaven in Essex near – near Grays.

*And I'm afraid I haven't heard of these estates before, these are Shell company housing estates?*

Yeah, the one at Stanlow was all prefabs, three bedrooms, rather nice actually, three bedroom prefabs. We had proper houses at Shellhaven. But they were all full of Shell people.

*And are you able to say something of your experience of living on a Shell housing estate, your view of it?*

[Laughs] There was nothing for the women to do. Shell didn't employ the women on principle, seeing as you were miles from anywhere else, you know, there was women stewing in their own juices, as somebody said. Coffee mornings. Oh and they ran a special bus so it was at – the Essex one into the nearest, you know, town, Grays, so we could do some shopping once a week [laughs]. Horrible it was [both laugh]. It was all right while the children were very young actually 'cause you know that was all I – quite happy looking after them while they were – John was born – the second one was born at Stanlow, so I was pretty fully occupied with one toddler and a baby ...

*And what – what decisions did you then make about part time or full time employment as the children grew?*

I'm going ... I mean I just got desperate in the end, and especially when they were threatening to send us overseas, I thought I couldn't stand that.

*You thought you couldn't stand it because you imagined it would be –*

Well even more isolated. Which would ...

*Among the other wives, did you find people who felt the same as you, who ...*

Most of them liked it.

*What do you think it – how would you account for the fact that you personally didn't – what do you think had made you different from other –*

Perhaps the life I'd led so far, working for Blackett and Jodrell ...

*And so –*

Well I think, you know, it's not only me, I'm sure my – my daughter and my daughter-in-law were – independent minded women who would feel the same [laughs].

*And so you – you didn't take the opportunity to – to go overseas and –*

No [laughs].

*And – but I think your husband did.*

Yeah.

*And you stayed – you stayed here and at what age were the children when you decided to take the – the teaching post that you took?*

Oh quite young, John was only about two, we had you know – we had people living with us, hmm, yes. But unmarried mothers I took from *The Lady* magazine, was it called, who ... if – first of all we just had a sort of babysitter I think but then I started taking these women, one – one was very nice indeed, came with her – lived with us with her babies and looked after mine, that was at – after we'd moved to Loughton.

We still had babysitters until, you know – when they were both at school we just had a woman who sort of did a bit of housework and was there when they came home from school.

*And this – these were unmarried women advertising –*

With their babies, yes. Yes.

*And what was the arrangement that they – they offered childcare in return for accommodation?*

I think so, yes [laughs]. Worked, hmm.

*And this allowed you to go out and teach?*

And start programming, hmm. I only taught for about six months.

[7.32]

*Perhaps we'll just talk about that six months period then briefly, you – you taught at –*

Hassenbrook.

*Oh yes I see, as a science teacher in a secondary school. Could you – I know you've told me off the recording but can you now on the recording tell me about your experience of that – of being a teacher there.*

Well, you know, I learnt to do it [laughs], that was the main thing. The headmaster sat in on one of my lectures and was satisfied and ... but I – I didn't think I want to spend the rest of my life.

[08.10]

As I say I read an article in *The Guardian* about programming which was just about, you know, this was 1960, '61 ... and I was actually on the Shell bus, I'd been shopping in Grays. I can remember like a bolt from the blue the idea came to me that I'd like to program, I thought I'd be good at it and so I started applying. I applied to IBM in the centre of Manchester, oh no, centre of London, but they didn't take me, which wasn't surprising 'cause I'd got two young children and it would have been a long journey. But then I applied to the Institute of Computer Science at – which is part of London University ... the – oh the senior administrator there was called Jan, did – warned me that there was a better candidate but she said, you know, they would still be happy to interview me. So I went, and when the interview was over they asked me if I had any questions so I said I'd been told there was a better candidate and were there any ... you know, inferior jobs that, you know, I was willing to do – although I'd – of course I'd got a PhD but I was quite willing to start at the bottom and work my way up. A few days later I got a letter from Professor Humphrey Davies at – professor of electrical engineering at Queen Mary College saying their programmer was leaving, was I interested. So I said yes and – they taught me – I mean I learnt to program by travelling to the Institute of Computer Science and I – I mean in those days you know Manchester University had a computer and London University had a computer and that was it [laughs], presumably some of the big firms had them as well but no – the – nobody on the staff knew [doorbell ringing] sorry.

[10.45]

*Now you say you were on the – on the Shell bus and you saw an advert in The Guardian?*

I'd seen the advert in *The Guardian* yes. Yes, I – I can –

*What – do you remember what that showed or said or described that made you?*

It described a program I think. And, you know, the new thing that people were doing.

*And you said like a shot out of the blue and that you – you thought you'd like it and you thought you'd be good at it?*

Hmm.

*Why?*

Hmm-hmm.

*Why that, why programming? Why did you – why did you think that you would like and be good at programming as opposed to any other active scientific activity or mathematical activity, why programming, why did you think that would appeal?*

... perhaps 'cause I'd liked Miss Gearing's maths where you had to lay everything out you know with precise details and correctly. And I thought – well I think in the early programming days that was also true.

*Incidentally you – when you were at the stage of being a mother and living on the Shell estate, and you had a PhD, did any of the other wives know that of – that you –*

No I doubt it really, no.

*So they didn't know that you were just some scientist and you had a PhD in science?*

I shouldn't think so really, no.

*Hmm.*

I quite liked somebody called Peggy Webster, I don't know if she knew. But I don't know.

*Okay, thank you so you – you start work at the –*

Queen Mary College.

*Queen Mary College electrical engineering department, but I think you said that you had to go somewhere else in order to learn programming and that was the Institute of Computer Sciences.*

Yes.

*Which is part of London University?*

London University, yeah, it was near University College.

*And how far was University College London from where you were living at this time?*

Well, I mean I would travel there from Queen Mary College.

*And you were living?*

Well for the first year or so I was still living on the Shell housing estate so it was an awful journey, a long drive and then a train journey. But when I moved out I moved to Loughton, which was very nice and it was a short journey on the, er, underground.

[13.49]

*Okay, could you then describe for people with no background in computing at all, what was involved in learning programming at the Institute of Computer Sciences? For people who don't know anything about programming, especially of this early programming, what did you learn and how did you learn it?*

How to put the data in and how to do – you know, write instructions to do calculations and print the answer out.

*What was the computer that was –*

Well the London University computer, enormous thing. Oh yes 'cause it wasn't at Queen Mary College the programs had to go, I think somebody would punch them on

– we had a machine to produce paper tape and then I – a courier, a man in a van took this paper tape [laughs] to the computer and a few days later we got the results back and discovered you'd made a small mistake [laughs].

*So the punch tape machine was at Queen Mary, this is the engineering department?*

Yes, they would be, yes, we had one.

*And the computer was where?*

Gordon Square in London.

*Do you know what the computer was called, the make of it and –*

Oh [laughs].

*Mark of it or –*

Homemade [laughs], I mean it took a whole big room.

*Do you have specific memories in the engineering department of the way in which you wrote programs?*

[Pause]

*What was – I mean what was a program, what did it – what did it look like before it was turned into paper tape?*

It was any calculations that people on the staff wanted to do. As I said, you know, before I started they employed girls with calculating machines to do any long calculation that they needed, and I wrote a program to do it.

*So for example how would – how would you write a program which – you know, to multiply one number by a number of other?*

Do you know basic?

*No, I mean I don't know and nor will many of the people listening, so I mean if you could – without obviously giving a course in programming how – could you give us a sense of what's involved in writing a program to perform a calculation remotely at this computer? What was it – what did a programmer do?*

I mean you'd have something like read A which would take the first number off the data, and then the next one that said read – read B and then another one that said C or let C equal A plus B. And then another one that said print C [laughs].

*So the language you were using was called basic?*

No, it wasn't, no, I was just saying that – I mean that's a language that's still around. No it was called Mercury Autocode, and it was written by Tony Brooker who I still spoke to the other night actually ...

*And you learnt autocode at the Institute of Computer Sciences? Who – who taught you autocode at the Institute of Computer Sciences?*

Goodness knows. I don't know.

*And you went there to learn it.*

Hmm-hmm.

*I'm imagining a big class of people learning how to program, am I imagining the right thing or was it a – just one to one?*

Smallish class I think. Not one to one, no.

*Just a small class?*

Yeah.

*And could you give me a sense of the – the make up of the people doing the course, what sort of person was learning, you were a young woman learning it, what were the other students – who were the others?*

I can't remember.

*Male or female?*

I can't remember, I mean there were women involved in computing at that stage because Judith Daniels was ... Mike Bernal was – Isaac Kabaza, those are people at the Institute of Computer Science.

*Did you know Tony Brooker at that stage?*

No, he was in Manchester.

*Yeah. And did you have any sense of why – of what your programs were for in terms of the engineering problems that were –*

No.

*No. So a lecturer would – or an academic would –*

Ask me to calculate something.

[19.10]

*And so you wrote this program, and then how did you get your – get the program turned into the paper tape that was –*

Oh I had a machine, like a typewriter that typed on a piece of paper of – and produced a tape at the same time. And we learnt – everybody learnt to read the tape and you

had – I mean you could stick two bits together and patch it up and had a thing called a unipunch which I used to have one, I seem to have lost it I'm afraid, so you – where you could put the odd hole in to you know correct it [laughs].

*So you were able to look at a piece of tape?*

Tape, and read it, yes [laughs].

*And oh that hole means read A or that means print C, you know, the –*

No no, the –

*How would you read it the, how would –*

Well letter by letter.

*So what does the – in that case what does the punch tape look like, apart from having holes in it?*

It was five tracks so it has a guiding – small guiding hole, two holes on one side and three on the other, and – you know.

*And this got – these pieces of paper tape got taken off as you said in a van to Gordon Square.*

And fed into the computer.

*Did you ever visit that computer?*

Oh yes, regularly, hmm, but not every day.

*And could you then – based on those visits can you say what you saw there?*

A big computer [laughs].

*I mean for –*

Not really.

*People listening when they hear big computer they might imagine the kind of computer they've got on their desks but big, I presume –*

No, it occupied a whole room, you've seen pictures of it surely haven't you? There must be pictures somewhere in those books, the Manchester one if not the [inaud].

*And for what reason were you visiting the computer personally?*

Oh to make the turnaround a bit quicker I think.

*So you took the tape yourself?*

Yeah.

[21.29]

*Okay, and this was – this is 1961 to '62 the period we're talking about there –*

Probably.

*Being a programmer in the engineering department, in terms of your CV you've got '62 to '66 lecture in mathematics at Queen Mary College.*

Yes.

*So could you tell me about that transition from –*

Yeah, after I'd been programming for a year ... Professor Ferraro who was head of maths decided he wanted a lecturer in computer science, I was the first one to exist I

think and I was the only applicant so they had to have me [both laugh], very reluctantly I think at first but I coped [laughs].

*When you say you coped –*

Gave lectures, people learnt [both laugh].

*And what – what did computer science at this time entail, what were you lecturing on?*

Well how to use this autocode language and, er, some numerical methods and statistical calculations and things like that, that involved calculating ...

*And, erm, could you talk about develop – ‘cause you’re here for four years at – as a – lecturing in computer science at Queen Mary College.*

Hmm.

*Could you talk about the changes in computing over that – over those four years, were you having to change what you taught in relation to developments in programming?*

No I don’t think so, no. The reason – I’d moved to Manchester I mean ‘cause my – I felt my – my family and friends were there and the best time to – I didn’t want to interrupt the secondary education of my children so I moved when the eldest one was eleven and the younger one was eight so that they could ...

*That was in 1966 –*

If that’s what it says –

*When you went back to Manchester, yeah.*

Hmm.

[23.45]

*Yes, how did – you've – you've mentioned that you had these ladies living with you who were – who had your –*

Oh not by then, I mean when the children were –

*That's when they were younger.*

Yeah.

*How then did – could you talk about your life in terms of the way that lecturing ran alongside being a mother at this time?*

Difficult, with difficulty [laughs].

*How did you manage, how did you organise your time in order to be a lecturer and a mother?*

I worked late at night on preparing my lectures and spent what time I could with the children.

*What did you do with the children? I asked you about time that you spent with your parents when you were a child, could you –*

We used – we lived next door to Epping Forest when we were at Loughton so we used to walk around Epping Forest, that was a – which was a lovely place [laughs]. And oh – no that was my grandchildren wasn't it? Hmm, no. They survived, my children [laughs], surprisingly but they've survived.

*And presumably you worked – you gave lectures at times of the day when they were at school, you were able to do that?*

Yes yes. Yes Professor Ferraro was very considerate about half terms and complicated things like that. I used to take them in with me if I was desperate, usually at half term 'cause you know universities don't have a half term.

*And you presumably had an office in this – in the department?*

Yeah.

*Yeah, so what did your children do while you were lecturing in the –*

Came and sat in the back of the class [laughs] ...

*And in this – as a lecturer in computer science in the department of mathematics at Queen Mary College, the other lecturing staff, were there other female lecturers on the staff in other –*

Oh yes yes, Mary Tropper was one, sat on the –

*Mary?*

Tropper.

*But you say that you think this was the first lecturer in computer science.*

Yeah.

*Anywhere or within London?*

There weren't many anywhere, certainly the first at Queen Mary. But when I left and came to Manchester of course Tom Kilburn was just setting up the department of computer science.

*In Manchester?*

In Manchester, so he would accept anybody who – who came along [both laugh]. I had a lot of lucky strokes in my life.

*So you applied then to Manchester – this newly forming department of computer science at Manchester University in 1966.*

Probably. It had been going for one year and I joined in the second – beginning of the second year when they were starting to expand.

*And who else was in the department at Manchester at this time when you joined?*

The ones who joined with me were called Brian Napper and Charles Outred and ... not sure I can remember the names of the others who were there before. Hmm. Can't remember ... no ...

[27.22]

*And you – you bought a – bought or rented a house in Manchester now?*

Bought one, hmm.

*Where did you live at this time?*

Deanway Mews [laughs]. A little – well – very well designed house.

*Where's Deanway Mews in – I don't know Manchester?*

Heaton Norris I think it was called, or Heaton something. I think it was Heaton Norris and we were there until – until my mother had a stroke and we bought the big house and that was in Heaton Moor. And lived there until I came here. Been here over thirty years.

*When did you come here to Overdale Road?*

Was it – oh probably not ... oh after my father died to be honest, I'm not sure which year that was, but it is about thirty years – oh I've got it in another file somewhere else if you really want to know [laughs].

*That's okay, I can record that later.*

[28.35]

*And so would you be able to tell me then about your – your role as lecturer at Manchester, so when you started what were you assigned to, what were you doing?*

Professor Kilburn, at that stage somebody called Frank Sumner was doing the undergraduate administration and Professor Kilburn said straightaway that I was to help him and if eventually I wanted to take over, all well and good. So I did. So I wasn't involved in the research, but I did all the undergraduate administration, timetables, exams, everything else that went on. I earned me money.

*So what's what you did when you started, was that your role throughout your time?*

I lectured of course but not involved in the research.

*And what did you lecture on at Manchester?*

Hmm, mainly applications of computers I think, somebody else taught the language mostly. Oh no I taught Pascal, programming languages and applications of computers, numerical methods and statistics and whatever, or operational research. Masses of books there, you've just [laughs] – somewhere ...

*And what was your – what did you know of research that was going on at Manchester at the time when ...*

Not a lot. I mean Tom helped in designing computers hadn't he, a very early computers, but I don't think he was doing that in those days. No, I didn't ... oh ... yes ... parallel computers and things, so there was a lot of research going on and ...

[31.09]

Now I retired when I was sixty, in order to look after my daughter's babies to be honest. Oh Tom had left, Tom Kilburn had left a few years before that and, oh, Dai Edwards took over, I was less happy without Tom I must admit.

*Why is that?*

He was good and, you know, and ... oh Dai Edwards was alright but he was going to – I think our – he left the same time as I did, whether that was because I left or [laughs] coincidence I don't know, but the one who took over, John Gurd, was entirely interested in research and he couldn't care less about what happened, how the department ran. And I believe it was absolute chaos when I first left because [laughs] nobody knew what I'd been doing or wanted to do it. Anyway, they survived.

*In terms of courses and management of students?*

Everything else, yes, that's right [laughs].

[32.23]

*To what extent was it necessary to keep up with developments in computing in order to teach your courses on programming and on numerical methods?*

Numerical methods, oh I was always buying books ... hmm.

*And could you say a little bit about Pascal, about the teaching of Pascal, about what it is?*

That was nice, yes, I liked Pascal.

*What is it, to [laughs] – in your own words what is – I mean I know what I – we could – anyone could get a book on it but I'd – as someone who taught it, what is it?*

It's a bit like ALGOL 60, and there's a good book on ALGOL 60, a very good book.

*Ah which you wrote partly [both laugh]. So ALGOL 60 is another programming language?*

Yes, an early one, but Pascal was rather similar.

*What – what could you tell me then about – specifically about ALGOL 60, someone who doesn't know anything about computer languages, why – why do you find yourself writing here a book on ALGOL 60?*

'Cause I was told to [both laugh].

*Told by who?*

I was still in the electrical engineering department then so it was the professor of electrical engineering.

*Is that the JS Collins who's the co-author?*

No no.

*No.*

No, I still – we still exchange Christmas cards actually, John Collins, he was sort of contemporary. Professor Humphrey Davies.

*And is this all – is this a – almost like the equivalent of a modern day manual for – are you writing a – is this a manual for how to program in ALGOL 60?*

Yeah, hmm.

*How does for instance ALGOL 60 differ from the language which you were using in the department of engineering to –*

Oh that was – I mean I started off with much more primitive languages and –

*And this is ALGOL 60 as a development in those?*

Yeah.

*How – in what way is it a – a more advanced language or ...?*

Hmm-hmm. More facilities I suppose.

*What do you remember about the writing of this book? We've got the finished product here but you're writing this with someone called John Collins.*

Collins, yes.

*Can you tell me about the – you're recorded here as lecturer in mathematics at Queen Mary's so this is before you've moved to Manchester, can you tell me about the writing of this book, what was involved in?*

Oh I mean John and I div – divided the topics between us, it finished up in his language actually, he wanted to make it all coherent and he sort of rewrote what I'd [laughs] written, without altering the sense too much ...

*Which bits did you – were you assigned to – to write?*

Don't know, don't remember. [pause] Hmm ... I think it was sort of more the examples that I did, the problems, the answers to problems and things like that I was doing. Yeah, oh there's standard deviation is given by that, I mean that would be something that I wrote, averages, examples of completely ALGON programs. I'm certainly – certainly not John Collins that bit.

*Ah, so this is page seventy and seventy-one, chapter writing a complete ALGOL 60 program in your book Principles of ALGOL 60 Programming and it's – it's essentially the use of this programming language to perform a standard deviation, what you have to type into the computer ... for example, 'Begin real A, S, sum, max, min, data;' and then, 'interga,' and so on down – down through to the end and in – on what sort of machine would you be typing this in ALGOL 60?*

... I think we were still using paper tape weren't we, so it was a sort of typewriter that produced paper tape.

[37.44]

Yeah, we – at Queen Mary College we had a machine that you could actually read the – instead of having a man in a van taking the tape we had a machine where you could read the tape in and it would get sent radar – or some radio straight to the computer at London.

*Thank you.*

[38.20]

*And so you – you worked at Manchester until 1974.*

Is that what it says, hmm.

*And then moved to the Open University, is that -*

Well yes my daughter had a baby, two eventually, and I had – had a brief spell with the Open University before but, er, gave up and then I went back full time more or less, I was – worked quite hard for them doing three or four courses at once at one stage. Because it was part time, you know, could give tutorials at the weekends and in the evenings and do the marking while I was looking after the children, hmm, I liked the Open University very much ...

*And that takes us up to 2008, the Open University.*

I was eighty when I gave it up [laughs], yes.

[39.26]

*Okay, well – well looking at the period that you're at Manchester, could you give – you've spoken a bit about your role in the department, something of the – of the teaching of languages and numerical methods, but could you say something of your social life at this time, your – your life beyond the department, key friendships, things done out of work, either with your children or without?*

... My son was dyslexic when they didn't know very much about dyslexia and eventually I sent him to a boarding school, which was expensive so I spent all my spare time doing extra jobs [laughs] earning a bit of money. That was when I worked for the Open University for a spell. I did extramural lectures, I was a staff – a staff tutor in the science department and, er, oh, was a warden at a hall of residence, of flats and every minute of the day I was busy trying to earn money to pay his blooming fees [laughs].

*And what did you your – yours – so are you suggesting then you had no time for –*

Yes [laughs].

*For socialising, for.*

Had no time.

[41.00]

*And you said that at Manchester you weren't involved in the research, you went into –*

Hmm.

*Is there a particular reason why you weren't?*

Hmm ... busy doing other things I think.

*Did you want to do research?*

No. No, I'm not really very intelligent, I just [laughs] work hard.

*And you've said that in work on geomagnetism and work with Blackett you felt that you were – you were treated equally with male scientists.*

Yeah.

*Could you talk about gender relations in computer science at this time?*

Same I think, you know, my impression is that throughout the university system, Open University as well, were women were treated the same as men.

*There was nothing specifically male about computer science or masculine about it?*

No, no.

*How would you account for the relatively low numbers of – relative numbers of female computer scientists in relation to male scientists?*

Oh there were two of the members of staff who were female out of a fairly small department. One became a – well both became professors actually, I didn't but they both Hilary and Carol got – well they both became professors.

*And what about earlier in geophysics, why do you think that relatively few women were found in geophysics in the '50s?*

I suppose women hadn't done physics I think at that stage. I – you could get into computer science from maths and more women did maths ... than physics.

*Hmm. That's interesting, so you had a sense that there were greater numbers of women studying maths than physics and therefore that would explain, since you can get into computing through maths rather than for –*

Well yeah.

*Why was that difference do you think – physics and maths, in terms of the –*

Hmm-hmm, probably the way they were taught at school.

*Hmm.*

[43.39]

*What was your – your mother's reaction to your career which –*

Oh very proud, yeah.

*Is that something you sensed or did you have – as an adult did you have conversations with your mother about her view of your success or talked to her about your teaching career?*

Not really I don't think.

*Did – did you talk to either parents about programming for example, about –*

Oh no, no ... wouldn't have been interested.

[44.20]

*Do you remember the rough date at which you got your own – your own computer?  
In other words we've talked –*

Oh Open University, they provided us with them, not the first – the first year we had ... a machine that allows us to use a remote computer, but then a year or two – about the third year I was working for them they actually provided us with computers.

*Individual computers on your desks?*

Yeah.

*Where – and the Open University was based in – where was this based at this time, so this is late '70s isn't it?*

That – oh I mean as far as I was concerned it was in Manchester but Milton Keynes I think was the – we used to go down to Milton Keynes sometimes.

*Hmm. And I wonder whether you – from this time, sort of late '70s, '80s could you talk about – 'cause I know that you use a computer now and I – could you talk about the development of your use of personal computers? I don't know when you first had one at home and the – your particular use of it?*

... I mean now I use it for email and shopping [laughs] but I suspect I used it for more serious things in the past.

*When did you first write lectures on – you know, word process lectures ...*

I doubt if I did to be honest, I should have thought I handwrote my lectures. I'm sure I did.

[46.11]

*Can you tell me about the – the development of your – your children's lives from sort of through school and university and – and their careers and your relationship with them as they become adults?*

Hmm, close relationship, even now. Erm, my daughter was very bright from the start, I taught her to read when she was about three years old, hmmm, and she went to the local school but – oh yes of course that was in Loughton wasn't it? There happened to be an excellent maths teacher who lived just across the road from us, and unusually for a local school like that she had a maths degree and her husband was a maths teacher at the local boys' grammar school, she was obviously a great help to my daughter. When – we moved to Manchester as I said when she was eleven, she'd passed the eleven plus and when I knew – actually our – from the station when I'd just been offered the job I phoned Miss Verity, my old physics teacher, and told her I was moving to Manchester with an eleven year old daughter and could she take the entrance exam even though it was a bit late. And Miss Verity arranged it all, she took the – they sent the papers down to her school in Loughton, Staples Road and she took the exam. Her results were very good because of this maths teacher and there happened to be a free place going and Miss Verity persuaded them to award it to Ruth so she went to Withington Girls' School on a free place [laughs].

*Was Miss Verity still teaching at this time?*

Yes – oh no don't think she was, no she wasn't. Don't think so, no she wasn't.

*Did your daughter then, as a child through primary school and before you moved to Manchester, show an interest in science and maths as opposed to other subjects?*

Well she just – you know, they had this excellent maths teacher and ...

*Who – who lived over the road, so was he – was he doing sort of extra lessons because of –*

No no, she just – she just taught at the school. Can't remember her name now but she was very nice.

*And what then did your daughter go onto do in terms of life and career?*

She went – yeah, she went to Queen Mary College actually and did physics, she had interviews at one or two universities but she thought Queen Mary College seemed nice and friendly because, you know, I'd spent a time there [laughs] I think. And so she did her physics degree there, didn't get a particular good one I think, a 2:2 or something, and then she trained to be a teacher, she came to Manchester and went to the education to ... train to be a teacher. Taught at one or two local schools in Manchester. Oh yes first of all she was a – what do they call them, supply teacher or something ... and then there was a vacancy at Withington Girls' School which she applied for and was appointed and she's been there ever since, she's now head of department [both laugh].

*And what – to what extent were you – could you help your daughter with her physics degree or what – to what extent did you discuss it?*

I haven't told you the complete story. She was teaching at some other school before she went to Withington, teaching physics, and the – while she was there the head of department left and they appointed a new head of department who was a physicist, so they called her in and told her he was going to teach the physics, she would have to teach biology, so she handed in her notice [laughs]. And when she got home at night she told me about this and we had a – an MSc in computer science and I rang up the person in charge of that and asked if there was any hope they could take my daughter, which they did and she got an MSc in computer science, so to that extent I helped her [laughs]. And then after that there was a vacancy at Withington which, you know, having an MSc probably helped [laughs] and she's been there ever since.

*Do you remember discussing the content of science or computing with your daughter, discussing –*

Not really, I mean see her regularly now, comes for walks with us [laughs].

*And could you do the same as you've done for your daughter for your son's education and you've –*

Well –

*You've said a little about this in terms of his dyslexia but –*

Yeah ...

*I – what was –*

Apart from paying a lot of money ... he ... dear, he went to the boarding school, got a reasonably good set of whatever they were, GCSEs in those days, I then – oh the head of the physics – head of physics at William Hulme Grammar School graduated with me and I rang him up and asked him, you know, if any chance of taking my son, so he finished up doing a couple of years at William Hulme Grammar School. Which I thought probably gave him a better education in science than the boarding school would have done. But he ... actually it was the biology – biological sciences that interested him most at that stage so he went to Sheffield and did a degree in human biology and anatomy and worked for a while, hmmm, in that. But then he gave up and he came back to live at home ... while my mother had just died and left me some money and personal computers were just becoming the thing, I bought him a computer to play with and I realised how good he was at using it 'cause you know I was teaching children to use them, teenagers to use computers, he picked it up very very quickly. Hmmm ... we – oh ... there was somebody at Manchester, I talked to somebody about how he could do an HNC in computing and this bloke said he would have to have a maths A level, which he didn't get, he'd got biology and physics and chemistry. So he went to arrange for him to go to Stockport College and he did A levels in maths and computer science and got two grade As. And then I started looking round for, erm, degree courses so – and what did I do, Bradford wasn't it, yeah. Applied to Bradford and they took him, first of all it was a diploma course but he did so well in the Christmas exams that they promoted him to an MSc, he did so well on the MSc that a member of staff asked him if he would do – start doing research with him and work for a PhD at the same time which he did, got his PhD and worked for Dr Kouvatso and then was really organising large computer systems and connections and – which he's still doing.

*And is this an area of computing that you're familiar with, is it something that –*

No, not at all, no.

*What do your children say about the influence of you on them, given that their careers seem to have –*

John's going to phone me tonight to find out what you've said [both laugh]. I don't know.

*Do they have a view on your role in their ...?*

I think they're quite proud of me to be honest [laughs]. We survived. Well I mean we – when John was at boarding school we were extremely hard up, but as I say, we managed.

*What effect do you think that being in a position where you had to combine a family life with career, to what extent do you think that that had an affect on your career?*

Well I never became a professor, hmmm ...

*Would it have – could it have been possible to become a professor?*

I doubt it.

*Why not?*

Not good enough.

*What makes you say that, what – you've said this I think at two different points in the interview that you think that you – that you're not clever enough and you're not good enough, but you just work hard is what you said.*

Yeah.

*What makes you – what gives you that impression, what makes you say that about yourself?*

The things I've done in life.

*At what points in your career have you felt that – then that you reached the limit of your ability, that you couldn't go further but you might have wanted to.*

No, never really, just ... I mean I didn't get involved with the research.

*I think you said that that was by choice, is that right, that you didn't?*

Hmm-hmm ... busy doing everything else.

*Why could you not have after a few years passed the administration of the department of the teaching to someone else and moved into research – would that have been possible if you'd – that you'd asked to do so?*

I didn't want to do it, I enjoyed what I was doing and I was good at it. I mean the – there were people in all the other departments, maths and physics and chemistry and – that I knew who were doing similar work to what I did in the department and I was just as good as any of them, I knew that [laughs].

*Good in terms of the programming?*

No, of running the department.

*What was involved in teaching undergraduates to use programming languages, how did you do that, how did you teach them to program in various languages?*

Lots of practical classes I think.

*And at Manchester then for example, from 1966 onwards, how would – how would you teach a group of students to – to program, what was – did they have a sort of terminal in front of them?*

Oh, we had a room full of terminals connected to – at first connected to a large computer downstairs. Later on they had individual ones but that was after I'd stopped doing it.

*And presumably this was one of the languages, ALGOL 60, would you have been teaching this at Manchester?*

No, I think we'd gone onto Pascal then.

*So it was Pascal at Manchester, any other languages as time went on there?*

Hmm, Cobol and things like that but I – I don't think I was involved in those. And, you know, machine code and printed languages.

[1.00.57]

*I wondered what – what you have in terms of a sort of personal archive of – you've got a – a box which you've brought things out of for me, I wonder what else you have in terms of a sort of personal archive of your work in geomagnetism and – and then in computing?*

I don't know, I think it's all here really.

*And you've mentioned you might have photographs of ...?*

Yes, I'd – oh dear ... there's thousands and thousands of photographs, I'm sure you don't want to go through them and I don't either. They were in a box under the spare bedroom – under the spare bed in my room which my son managed to drag out last week, but I shut it up again quick [laughs], there's thousands and thousands of them.

*Photographs of – what are they photographs of?*

I – I think I inherited all my parents' as well, so they're mainly little children.

*Do you have photographs of your – of you working in geomagnetism, of –*

No, no.

*Of fieldwork and –*

No no.

[End of Track 2]

### Track 3

*Okay so you've – you've – you've got here a – a photo of your graduation in physics from Manchester.*

Yes.

*And I wondered if – if looking at the photo you could – well firstly identify yourself and – and then say anything that you would like to say about the people that you can see there.*

Well the girl on the opposite end is Marjorie.

*On the left hand side, yeah.*

And she and I are still in touch, she married Arvid who is not on the photograph and he moved to America to be a professor and she – she is there now. And that's Bill Baker, he lived fairly near where I lived and we both cycled everywhere so we frequently cycled home together from events.

*He's to the left of Professor Blackett, yeah.*

Blackett, yeah. That's Edna who was one of the other women on the course. Next to me is Ray Neate and Roy ... my – I sort of hero worshipped Roy, he was ex-army, quite older – older than the rest, but he organised the youth hostelling holidays and our trips abroad and socials in the [laughs] union, various things. And I believe he'd been at Dunkirk. He died quite young actually ... I don't – can't remember anybody else name. Oh I think that was who we – think he was called Harold.

*The one squatting down?*

Down, yeah [laughs].

*And how did you see yourself in relation to these other students taking physics?*

Was just one of them.

*Did you feel more capable, less capable, hmmm ... as enthusiastic, less enthusiastic than the others?*

I was enthusiastic. Marjorie and Roy both got a first, I mean I never felt that I would get a first, I got a 2:1 which is what I'd expected [laughs].

*Why – why had you felt that you wouldn't?*

Well I wasn't as good as them [laughs].

*And what – what gave you that impression, that you weren't as good?*

... Well as – exams during the course I think.

*And how did this group of people sort of talk about physics, how did they view their own subject given that they were taking physics, other students were taking English or – or the arts or languages or other sciences, what was kind of said about the status of physics at that time, how did you feel that –*

Have I told you about the rainbow [laughs] ... well I don't know ...

*I mean was it seen as a – a conventional subject to take or –*

I think it was to the ex service people, 'cause they'd probably been involved with ... things, relevant.

*How did the ex service people, apart from the fact that they were male, how did they differ from the students who were simply that, students, that had come from school?*

Well they were older and they ... you know, as I say they organised all the things that went on. Hmmm, yeah, used to go to dances in the union, if people from other

courses asked me to dance, asked what subjects I did, told them physics, that that was the end of the conversation like, you know, they ...

*Why?*

They were a bit frightened of women who did physics I suppose.

*At the time why did you think that was, how did you explain it?*

Hmm ... that way I think. It's true if you go to a – see a doctor now and I have to say that I'm – although I'm a doctor I'm not a doctor of medicine and they say, 'What are you a doctor of?' and I then say, 'Physics,' and [laughs] they're all very impressed, there's no medical doctor enjoyed physics at all [laughs].

*But why would boys then have been frightened of a – of a woman who did physics?*

Wouldn't you be?

*No, so I'm wondering why they were?*

[Laughs] I don't know. 'Cause they hadn't liked physics I suppose.

*I – do you – did it have a certain image that put them off, is that what you're ...?*

Yes, I think – I mean children at school are avoiding physics now aren't they, it's seen to be a difficult subject.

*I'm wondering why they wouldn't want to dance with someone who's simply doing a difficult subject [both laugh]?*

They did dance with me.

*Ah sorry.*

Just ended the conversation like [laughs].

*Ah, yes. Because they couldn't talk to you about it?*

I suppose, hmm.

[6.51]

*How was physics – what was sort of the status of physics in – compared to other subjects at Manchester, compared to the arts?*

... Blackett had a very good reputation didn't he and ... I don't know.

*I asked partly because of the – the CP Snow arguments that came later about the – the two cultures and wondered what – almost what was the relative status of arts and sciences as you perceived it there?*

No, that was just something I couldn't do. Physics I could do [laughs].

*What do you think it is – this was a question I was going to ask, what do you think it is about you that made physics appealing?*

Oh Miss Verity, no doubt. Excellent teaching, very inspiring.

*Is there something about the – the subject itself and the nature of you that made physics appealing?*

I suppose I could do it, couldn't I? Couldn't write essays. No good at languages.

*What is – in physics what is the doing? I mean with essays I – I can see that it's sitting down, it's reading something, it's reading something else, it's composing something, but when you think of – when you say you could do it what – what was involved in doing physics that you could do?*

Well the lab work and passing it on. Why – why did you do geography? [both laugh]

*Hmm, fair – fair question, yes. I wondered whether there was something about the – obviously English is a very different subject to physics and the sorts of – and the content of it is very different and I wondered whether there was something about the content of physics that particularly interested you. I'm sort of trying to think about your relationship with the subject, what – I mean were there –*

I think, you know, I didn't have – had a very good maths teacher the first few years but the maths teachers when I was older I didn't get on with, and I did get on with the physics teacher, that was the real reason.

*Well I'll come back to Miss Verity in a little while.*

[9.26]

*Just finally on the photograph, we've got Professor Blackett there standing among the students, could you give us a sense of how he interacted with students?*

He was always very friendly, I mean he lectured to us on gyroscopes and things like that. Hmm ... and he ... I don't ... his own children were younger I think weren't they a bit, slightly younger.

*Did he reveal anything of his – of his actual inner self or his – his private self in lectures either through stories or anecdotes about things that he'd done?*

No.

*It was formal lecturing?*

Yeah.

*Okay, thank you.*

[10.32]

*Now, I've got some questions to follow-up on last time and the first thing that I was curious about in – in the story of your mother's life was I was wondering you're your mother's older sister wasn't the one that cared for the – for the brothers?*

Yes, yeah.

*Allowing her to continue with the Latin, I wonder –*

She'd got a job I think, that was the main reason, she was teaching ... I think my mother offered to do it, I think she regretted a bit afterwards but ...

*I see, yes, thank you. And you mentioned that your father had hobbies?*

Well photography, he did this.

*He took that photo?*

Yes, and enlarged it and everything else.

*Could you tell me more about your memories of your father's hobbies, you mentioned photography and tropical fish last time but there might be others, memories of him doing those things?*

Well he – he played golf and billiards and ... no nothing... I know ... I told you the photography he turned – we had a – an underground air raid shelter during the war.

*You told me about the air raid shelter.*

He converted that into a – a darkroom to –

*Did he?*

Yes, enlarge and develop his photographs.

*To what extent were you involved with this hobby?*

Oh not at all.

*What did you see then in terms of his conversion of this – conversion and use of this air raid shelter, what do you remember him –*

I wasn't there at all.

*Where were you at that time?*

[Pause] Busy being a university student I think.

*What did he photograph apart from this graduation, what did he tend to photograph?*

Oh there may be some of – of his there in the weddings of relatives and his dog, and me with my dogs, and my mother. There are photographs like that about.

*Hmm. And what do you remember of his keeping of tropical fish?*

[Laughs] ... Not really nothing much, except the tanks and – and things.

*Where were – the tanks were in the – in the house?*

In the house, oh yeah, yeah. Yeah, making me sad now about fish, because I had a couple of goldfish in the kitchen that I'd had for years and they ran out of food a few weeks ago, I bought them some new food and I didn't realise that they didn't like it, and it had – the water had got all nasty with this foods that they weren't eating before I realised.

*Oh dear.*

And one of them died, yeah, sad that.

*I'm sorry [laughs].*

Yes [laughs], sniff.

[14.16]

*Now you've told me about a – some memories of things done with your father and things done with your mother last time but you didn't tell me anything about things done as a whole family, so things that your father, your mother, you and your sister all did together?*

I –

*What memories do you have of time spent together, anything –*

Well I mentioned the two tandems didn't I, well in my notes.

*Your notes, yeah.*

Yeah. Well so we used to go out for weekend picnics ... and ... oh and – and ... we used to go out with my father's firm had days in Blackpool and places, we used to go on those, hmm. And we had family parties often and Christmas, birthdays and that, and my mother was a very good cook.

*And in this – in what you said about your mother I got – I got the slight impression, and this might be a false impression which you can correct, that the relationship between you wasn't sort of obviously close or affectionate.*

No.

*And –*

Didn't get on very well with her. My younger sister was much closer to mother than I was ...

*What ... why – why and –*

I don't know why [laughs].

*How did the not getting on manifest itself?*

... Not sharing confidences, hmm.

*Do you remember – do you have memories at all of sort of emotional or affectionate relations with your mother?*

I told you about buying the house?

*Yes, that's later on isn't it?*

Yes.

*I wondered as a –*

Yes, oh we used to – I mean I used to sit and talk to her there to ... occupy her.

*Did you – what did you talk to her about as a – as a child though, in terms of that indicated a sort of closeness or ...*

I don't know really.

*When you say that your sister got on better with her, what are you imagining your younger sister doing that you didn't?*

I thought she did ... well I'm ... just enjoying spending time with her, which I don't think I did as a teenager ...

*But you're not sure why or –*

No.

*In what ways are you different from your sister would you say?*

[Laughs] you better ask her that [laughs] ... I don't know ... I feel very sorry for her at the moment, her husband's got Alzheimer's disease but in the last week or two he's starting passing on some blood from his bowels, so she was terribly worried when I spoke to her the other night, I don't know, I must phone again and see what – what the state is.

*But if we could go back in time and – and be with you both as teenagers let's say, how would – how would we think that you were different?*

[Pause] I don't know.

*Were you – were you mentally different in any way in terms of what you were –*

Oh she was better at maths and ... I think she was shyer and quieter than me probably but ...

*But did you like different things, like doing different things?*

We didn't do things together at that age. When we – each had our own friends.

*I mean while you were, let's say, I don't know, you – you went through a period where you were going to church with your friend next door.*

Oh yes, oh she used to –

*While you – while you were doing that sort of thing what might she have been doing?*

Oh she would have been too young to – when she was – just been playing in the house, it was only for a few years when I was –

[20.12]

*Do you remember particular toys that you played with, you –*

[Laughs] Oh yes Joyce had a – a lamb, it was really – it had a zip so you could put your nightdress in it and she used to carry that around everywhere [laughs], I'd forgotten that. I don't think I had any toys like that.

*Last time you spoke – when I asked you about toys you said bikes, but did you have indoor toys, things that you played with inside or particular books that you read?*

I can't remember anything special ... I mean late ... hmm, I was quite young when I started sewing, the mother of the girls that I went to church which [laughs].

*Miss Allan?*

Uncles, Mrs Uncles.

*Ah, okay.*

I don't know [laughs], had been a dressmaker I think but I – I spent a lot of time with her using her sewing machine and she taught me how to do things. Later on when I retired I went to dressmaking classes and got City & Guilds Part One and Part Two, so I'm qualified to teach dressmaking if you want to do dressmaking [both laugh].

*What appealed to you at that age about dressmaking?*

Making my own clothes I suppose.

*And was there something that appealed to you at that age about spending time with other adults, adults other than your parents?*

Possibly.

*You've spoken – you spoke about Mrs Allan at the church you spent time with –*

Oh yes, the church, yeah, she was the wife of the minister, yeah, that was later.

*You've now got sewing with Mrs Uncle and then there's a friendship with Miss Verity.*

Oh yes, oh yes.

*It seems – it seems just from the outside as if you developed friendships with other adult women at this time.*

Possibly, I hadn't thought of it like that but yeah.

[22.53]

*Now it – last time you – you told me the story of the going to church and you said that you did it partly to irritate your parents.*

[Laughs] It was a nice walk too.

*To what extent at that age did you believe in God?*

Oh totally I think, I think. And for many years after.

*How many years after?*

Hmm, until fairly recently to be honest, I think I'm ... the last census form I put no religion.

*What's changed then recently.*

Doing the course on Darwin for one thing, although he himself was still religious, but ... made me wonder, the origin of species.

*So through all of your work, all of your degree in physics, your work in geomagnetism.*

Oh yes.

*Work in computing you believed.*

Yeah, yes, I used to attend, you know, religious group meetings at Manchester.

*How did that belief run alongside a subject like physics and activities like watching meteors?*

Well wasn't when I was watching meteors 'cause I'd left Manchester and I was at Jodrell then ... was Lovell religious? Could have been, I don't know.

*And was there any link between a) a belief in God and b) the kind of physics that you were doing, either studying your bits of meteors or the geomagnetism of rocks?*

No [laughs], no.

*I only ask that some scientists sometimes say that, for example, through doing this sort of thing they're exploring the details of a created universe if you like but it seem –*

No, I didn't think that.

[25.16]

*Now I wondered whether you could, erm, tell me as much as you can about Miss Verity and especially to begin with how as a – as a young woman or older child, so a high school student and then as an older woman, how you viewed her, how you saw her?*

... Very kind person ... very good at physics, which I enjoyed, and a – and we told you were borrowed her caravan, her tent. I used to visit her fairly regularly when I was still working in Manchester, after she retired, and my daughter got to know her quite well and that – unfortunately had – I mean I didn't make contact with her at that stage, Ruth used to drive her around to – you know, any events that she wanted to go to. She – she knew that my daughter was a physics teacher at Withington.

*And – but how did you see her as – as different from other women that you knew?*

More sensible [laughs].

*In what way more sensible, what does that mean?*

[Laughs] Don't know ... don't know.

*I just get the sense that you – that – and particularly now that you've said that there was a kind of admiration for her, but I –*

Yes, oh yeah.

*But – but I wondered on what basis you had admired her, what was it about her?*

What she could do ... I don't know, just ... I don't know.

*When you say that she was more sensible than other women you knew, what did she do or not do that was different?*

... Well she was very kind to us and she ran extra class – classes in her – her house in the evening to help us to get into Manchester University. Encouraged us to bring cakes to lay on a tea party for ourselves and ... I don't know.

*What did she – what did she say about your intention to study physics?*

Oh she must have been pleased and she had three students out of our year who all went to do physics.

*And about your work at Jodrell Bank, what did you – what did she say about that?*

Oh probably wasn't in touch with her then, it was later on, I mean much later on when I was a lecturer at Manchester.

*And as a – as a young adult how – how would you have seen her as being different from, say, your mother?*

She was a physicist, a working woman. I mean she knew the first couple of years at Jodrell that – and when I was there as a student, but I didn't have any contact with her when I was there permanently ...

*Is that – is she someone that you could talk about physics with beyond her role as a teacher?*

Yeah, you could if you wanted to.

*Did you?*

I don't think so [laughs].

[30.11]

*Now it was quite striking in the last session that, erm, there weren't any memories of the act being taught physics, of things done in classes, either in school classes at any age, of the sorts of things that you – that you did. And considering that you've said that you – you enjoyed physics, are you able to remember the – things done in school classes or in laboratories, even if it's at a – it might – could be at any stage of school or at Manchester, the things that you actually did that you enjoyed, what – what did you find yourself writing or making or constructing or looking at or – or doing in the learning of physics?*

... I don't remember, it's a long time ago and my memory's not very good. [pause] I don't know ... I can't remember ...

*Were there any practical work that you remember?*

Ooh we did all the practical work we should be doing, with lenses and electrical equipment and so on, electrostatics ... I don't remember the details.

*Do you remember anything about how – you said that Miss Verity was a very good teacher of physics, but how did she teach it, standing at a board, writing?*

Yeah ... yeah. I'm sorry my –

*That's fine [laughs].*

I can't remember.

[32.36]

*When you came onto be working as a – a postgraduate and you're working with people like Pat Blackett, and Keith Runcorn a little bit you – you knew, and Bernard Lovell, how did you see – how did you see these people in relation to yourself in terms of their backgrounds, how like you or different from you did they – they seem?*

[Pause] They'd had more experience hadn't they; Lovell had been working on radar during the war, and Blackett had been doing something. I don't know, just more experienced, older. [pause]

*You said that you – while working on rock magnetism that you made visits to Cambridge to see Keith Irving.*

Ted Irving.

*Ted Irving, sorry, Ted Irving.*

Just once wasn't it?

*What – for what reason did you go, do you remember?*

Social I think [laughs].

*And what do you remember of that visit?*

Talking to Keith mainly. And I don't – just went for fun really to see what they were doing.

*And what did you see of what they were doing.*

Well I talked to them both.

*To – to them both, to Ted and Keith Runcorn.*

Ted and Keith Runcorn, yes.

*And how were they going about it?*

... They were getting rocks from different places weren't they, and, you know ... and ... I don't know ... getting rocks from under ground didn't they, I think.

*Did you see their sort of experimental set up, their – their measuring of equipment?*

Yes, I must have done ... can't remember.

*And I wonder whether you could tell the story of – of what had happened when Pat Blackett discovered that you'd gone to Cambridge to make this visit?*

Oh he just invited me into his office to – I mean he knew there was ill feeling between himself and Runcorn, hmmm ... he asked if I'd any idea why and I haven't, I don't know, he didn't mention it. I don't know.

*Do you have any suspicions about why there might have been that ill feeling between them?*

No not really, just competition, people doing the same sort of experiment.

*While you were working on the rock magnetism work you said that Pat Blackett came to see you almost every day.*

Yeah.

*What did he say to you when he came to see you almost every day.*

[Laughs] I don't know, just what I was doing and how it was going ...

[37.39]

One of the things I was good at was making boring repetition [laughs], you know, experiments that you had to do lots of times, hmmm, like reading the magnetometer hundreds of times, and at Jodrell Bank measuring velocity of meteors by studying hundreds and hundreds of photographs [laughs]. The other thing I was good at was administration, which I ... made use of at Queen Mary College in Manchester. Don't think I'm a brilliant scientist in any other way [laughs]. So with Blackett I was ... very busy measuring rocks for a long time.

*And can you describe that repetitive process of measuring the rocks, what did – what did your day involve?*

Well you had this disc of rock you put on the magnetometer, you raised it up and the mirror swung from one side or other, you made a note of where it had got to and went

onto the next bit of rock, [laughs] and you had hundreds and hundreds of them to go through.

*How did you feel about doing that same thing over and over?*

Yeah, I think that was one of the things I was good at [laughs]. That's why they employed me. I mean it was pretty similar at Jodrell, looking at hundreds and hundreds and hundreds of films of meteor records. Measuring the distance between them ... hmm.

*What made you good at or suited to –*

Boring things [laughs], I don't know.

*When you look further back do you – do you see other things that you've done in the past that have been like that that you've done well, things that have involved –*

Repetition, not really.

*And how did you feel about – last time you said that you felt that you had done the – the donkey work you said for the polar wander work, or geo rock magnetism work.*

Yeah.

*How did you feel about having done all of the actual measuring but not been involved in the sort of presentation of the results?*

Oh I wasn't very good at presenting – presenting those results. I was much better at using the magnetometer.

*You – you've describe – as you describe it it sounds straightforward; put in disc, watch for bit of light on, measuring the scale.*

It was.

*But I wondered whether you could say anything about the sort of – the peculiarities of the equipment, the things that could go wrong if you weren't watchful or the – the things that you had to do to make sure that one measurement was commensurate with the next measurement and so on.*

... Not really ... I mean inserting them, it had little tiny magnets in the magnetometer which was tricky, but I got fairly good at that.

*What was that, you had to actually set it up did you by putting magnets –*

Hmm.

*Why was that?*

... How it worked I think, it had two little tiny magnets.

*Whereabouts did the tiny magnets go in relation to the big hoops that you described last time?*

Well they were inside those, the – the mirror was on the end of a wire with these tiny magnets, so they made the mirror turn ...

*And – and this may seem pedantic to ask, but what was involved in being good at putting the little magnets in, do you remember?*

[Laughs] Delicate finger work [laughs].

*Are you suggesting then that anyone could have come and done what you were doing?*

Yeah.

*In what way was it necessary to be a physicist to do it?*

... Don't suppose it was really. Hmm, I and still think my main skill was the administration, which again you don't need to be a physicist but at Manchester I got to know all the other people in the other departments who were doing something similar and – and I knew I was good. All the admissions and lecture timetables and exams and degree dates, events and everything that it –

*What gave you the impression in doing the rock magnetism work that you wouldn't have been good at writing up the results?*

Oh I was no good at English [laughs] ... John Clegg was much better.

[End of Track 3]

## Track 4

Hmm ...

*Last time you – you mentioned working with Peter Collins and said not – sorry Peter Stubbs and said little about John Clegg at all, I wondered whether you'd want to say a bit more?*

... Just, you know, he and I were friends. I mean I got to know him at Jodrell, I think ... on a number of occasions there I think. Before I graduated, I first got to know him. And, er, 'cause he was at Jodrell all the time I was there and then when I left and went to work for Blackett he was put in charge of us and – and ... we often went for a walk and had a drink at lunchtime together, and we enjoyed each other's company very much. And I saw him for many years after, he came – after I retired, he came up to Manchester and out – I can remember seeing him all over the place. We were just very close, very good friends. A bit sexual but not much.

*And how – how would you view him as a scientist in relation to yourself? How is he like or different to you as – as a scientist?*

Better, much, he designed the aerials at Jodrell and things didn't he, no way I could have done that.

*Did you talk with him about science?*

Not really [laughs]. No. Talked about anything and everything else.

*What did he say about the rock magnetism work?*

... He and I went collecting rocks on one occasion, usually I went with Peter out there.

*What was his level of confidence in the method as a way of determining whether continents had drifted?*

... I think it was just a job for him really.

*And do you – it would be wonderful if you had any memories of that trip you took collecting rocks where you went, how you collected them, what you discussed on the way, how you travelled?*

Oh I had the van and – the van that belonged to our group.

*Where did you go?*

Oh I don't know, Peter chose the sites because he was a geologist. I don't know where I went with John.

*And what do you remember about the actual extraction of the samples, the getting of them?*

Well, just hacked out lumps of rock and took them back.

*What was his view of Blackett?*

... I think we all had a great respect for Blackett ... good scientist, very good minded person.

*And – and Keith Runcorn, what was his view of Keith Runcorn?*

I don't think we mentioned Keith.

[5.05]

*Either at – either at Jodrell Bank, or at Manchester and then Imperial, what were the hopes and ambitions of the other research students who you've said were almost entirely male, what were they – what do you remember them hoping to do with the physics research that they were doing, what were their ambitions for themselves?*

[Pause] Hmm ... they went into industry or civil service or something.

*Did you ever have similar ambitions?*

Oh yes, I went – before the civil service panel and was accepted but, er, I decided to stay on at the university.

*When was this? I mean which university, what did you stay on doing instead of going to the civil service?*

Can't remember [laughs], can't remember. Hmm ... I can't remember at what stage it was but it was down in London, probably at, when I got the job at Queen Mary College. Hmm, I think it must have been, I can't remember.

*And what was the job that you applied for with Ferranti?*

Oh that was a long time ago wasn't it, yes. Programmer, in – very early – very really programming.

*Which was before the rock magnetism wasn't it, you – you'd – the last time you said you'd been off – you'd been offered the job straight after Jodrell Bank.*

That's right, yes, yeah, they were taking people on I think at that stage, Ferranti. But it – very early days ...

*Do you have further – go on.*

Sorry, it was after Jodrell Bank, before Blackett, yeah.

*Hmm.*

Sorry.

*And what had made you apply for that?*

Oh had to do something.

*Were you applying for other things as well as this?*

No, that was the only one I applied for at that stage.

[8.31]

*And I wonder whether you have further memories of using the Brunsviga calculating machines which you mentioned for the first time using at Jodrell?*

... Yeah, must have had them at Queen Mary College for the children to remember them. But I must have used some sort of calculating machine at Jodrell. Hmm ... I don't remember, I don't ... I mean everybody used them in those days didn't they [laughs]?

*But I mean if – if you can imagine it in your mind's eye now looking at it what – what can you see?*

... No I think I must have used it at Jodrell to calculate the orbits, but the children weren't there and they remember playing with them so I must have had some at Queen Mary College or some [laughs] ...

*And is it something that involved a particular skill to use?*

No, you just turned the handle [both laugh]. I can find you the picture of that if you want [both laugh].

[10.06]

*Hmmm, I ought to have asked how you actually felt about – you said that you felt that you were good at it but how did you actually feel, in other words enjoy or not enjoy,*

*the process of making repetitive measurements, whether of meteors or of rocks in – how did you feel about doing that work?*

... I was quite interested in the results and I didn't mind doing repetitive work.

*What do you remember of the – getting the final results, in other words what do you remember of the discovery that Britain had moved and – and twisted a bit.*

Sometimes the North Pole had been the South Pole and vice-versa and ... I was fascinated [laughs].

*And how was that discovery made, did it gradually emerge as you were working through the samples –*

Yeah.

*Or was there a particular –*

No, gradually.

*Who was the – who was the first to sort of spot this move?*

Well I used to plot the results that I got, which I suppose I've – I'd be the first in our group to know about it [inaud].

*How did you plot the results?*

Mind you I don't know whether they needed to do it, 'cause they were all the same generation, hmm, just compared it with the present day position of the North Pole. Yeah. I think, you know, I knew it was different [laughs].

*Who did you first tell?*

Oh, as I say Blakett came in regularly ...

*And what was his reaction?*

Interested.

*And you say that you plotted –*

No, hmm, must have been something else I plotted, I don't know. [pause]

[13.09]

*Now later on you've described a period where you were, hmmm, living on Shell housing estates.*

Yeah.

*And I wanted to first ask how did you feel about now not doing science?*

[Pause] I mean I was busy having babies wasn't I? I didn't think about much else for the first few years and then realised how bored and miserable I was, so. I had a little in common with the other women, how much happier I'd been when I was working.

*Why do you think you were happier when you were working, it might seem obvious to you but can you sort of put it into words?*

... I think I felt more at home ... yeah. Very boring at the Shell housing estate, I mean all you did was entertain the other wives to coffee and tea and so on.

*How were – how were these women different from you?*

Well boring [laughs]. My sister visited us at ... Shellhaven and she didn't like the atmosphere there at all, she picked it up before I did. I don't know what it was. Just stewing in our own juices, as they say.

*What were the hopes and – and sort of ambitions of the other women on the estate?*

To look after their husbands and children.

*Did you tell your husband how you felt about living on the estates?*

No, I don't think so, not until they wanted to send him abroad and then I just said I wasn't going.

*What was his reaction?*

... He'd – well I said he should go and I would stay, but when he told his bosses that, it turned out that was a wife was part of the package and they wouldn't send him without me.

*So then what happened?*

I got a job, but I stayed living at Shellhaven, I've told you this before. It was after another two years he met Ann – I mean he came – came to visit us regularly at Loughton and did a lot of work in the house for me and spent Christmas and summer holidays camping with us and things. Hmmm, but it – after a couple of years he met Ann and decided he wanted to marry her, came and asked me if I'd give him a divorce and said, 'Yes, gladly,' and that's what's happened. The children hate Ann [laughs].

*What was the reac – the reaction of the other women on the estate to this?*

Me working, I don't know, I never asked them, I was too busy [laughs].

*And while on the estate, at the time that you realised you were bored, to what extent did you keep up with developments in science?*

Not at all.

*And what did you do with the – with the children on the estate?*

While we were living there you mean?

*Hmm.*

Talked with the other women, played with their children, we used to go for walks, and had a dog, yeah ...

*And could you describe the – the two places physically, Stanlow to start with?*

Well it was on the banks of the Manchester ship canal ... and were in a prefab, it was a rather nice prefab actually, and we had a stepladder – it had a wall at the bottom of the garden and there was a stepladder against it, and my one year old son used to climb up the steps and when he saw a ship he would go, 'Hoo hoo,' because that was what they did [laughs] as they were going down the ship canal. I don't know. They were prefabs in a circle with a play area, a grassy play area in the middle with swings and things.

*You said that you didn't keep up with science, did you read anything at this time?*

Only novels I think. Oh I read – yeah, I read some quite good novels, I mean I was surprised *The Guardian* a few months ago gave a list of books that you should have read and I'd read them all [laughs].

*And then what about Shellhaven, could you describe that as a physical place?*

Much – we had a big five bedroom – was it four or five bedroom house there, right next to the refinery. I remember one famous occasion driving home from holiday we came within sight of – you know what a refinery looks like and John said, 'Oh there's home,' [laughs] we always remembered that since and ... no there was a – oh and a row of these big houses, there were some smaller houses opposite to the workmen and we were in one of the big ones, which was how we could take this housekeeper. I told you we had a – an unmarried mother as a housekeeper. At the end of the road there was a – a club where they served drinks in the evening and dances and things and ...

*And – and how would you characterise the conversation of the – of the women at the – at the coffee mornings?*

Zero [laughs], they wanted to talk about their husbands and their children, that was it. And a bus used to come, every day I think, to take people shopping ... once a day ...

[21.42]

*You've said last time that you think that other independent minded women wouldn't have liked it either.*

Oh they wouldn't on – my daughter and granddaughter would have gone berserk [laughs].

*And I wondered whether you had any – I wonder what you thought at the time of sort of popular feminist movements in – later in the '60s and '70s when they came along?*

... Hmm, I think I was a bit lucky at universities 'cause they treated women the same as they treated men and you know, grew up with the idea that that's how it should be. I'm sure your wife is the same [laughs].

*But I mean as the kind ... as – as efforts for equality became more sort of formalised in popular movements in the '60s and '70s, you might have heard things on the radio or read about them, what was your view of – of the feminist movement I suppose?*

A good thing, women are equal. Different but ...

*Were you involved in those movements at all?*

No no ... not political anyway.

[End of Track 4]

**Track 5**

Closed

**Track 6 [Part 5 on <http://sounds.bl.uk>]**

*Another thing that I'd like to ask you about is, hmmm, you've given me some notes to say that when you became lecturer in computer science at Queen Mary College in 1962, you were involved in appointing a team of people to –*

Punch the tape.

*Produce punch tape, okay.*

Hmm.

*So could you say how you went about appointing that group?*

... They must have advertised the job somewhere, I don't know, I didn't involve – I wasn't involved in the advertising but I did interview them when they came, we ... it was part time work, so it suited women with children at school and that – that's where we mainly recruited from. And one – well the senior technician sat in on interviews as well, so ...

*And what were you looking for in the candidates?*

Anybody who'd come to be honest [laughs].

*And what was the – what were the duties of the –*

Punch holes in paper tape.

*Can you say a little more about how – presumably they weren't – they didn't have a bit of paper and they were punching holes at random, can you tell me what they were given and how they –*

It was a sort of typewriter machine and it produces – oh as well as a typed sheet it churned out this paper tape with pattern of holes for each letter, which we could all read.

*And what was involved in managing the group?*

Oh just ... I don't know ... I mean there weren't any problems so it sort of managed itself, when somebody left I had to appoint somebody, an extra person, so. I mean it was only for a year or two and then students had more [laughs] direct access to – the direct – the central computer.

*And what was the – what was their job title, these ...?*

Well we all called them punch girls. I don't know.

*They were all – all women?*

Yes, they were all women. Yeah.

*And you say that was linked to the fact that this was a part time post do you think, did men apply?*

I can't remember any men applying, no.

[03.04]

*Now last time you said that when you – you said various things about applying for jobs and you said that you were taken on as a lecturer in computer science, you said, by Professor Ferraro but you said, 'Very reluctantly,' you were taken on and then when you went to Manchester you said they – Kil – Tom Kilburn was setting up the department and he would have accepted anyone who came along. Now these are quite self-deprecating comments about you, but what – what gave you that – what do you think gave you that sense of being lucky rather than entitled to these posts, where does that feeling come from do you think?*

I – I ... I knew at Queen Mary College – I mean I had been a better applicant and he withdrew at the last minute, and it was obvious that they were very dubious about appointing me, whether I could – well I don't blame them to be honest [laughs].

*Why?*

Well I'd never done any lecturing.

*What made this other person a better applicant, in your eyes?*

He was already a lecturer I think.

*Did you know any more about him than that?*

No, I don't think so and he probably had much more experience with computers.  
[Talking to dog]. Oh mind you're going to trip over this you stupid dog.

*[Laughs].*

No, go away, go on out, out, go on ... no go on I know it's nearly walk time, not yet, go on out out. Go on.

*And you also said last time, 'I'm not really very intelligent, I just work hard,' can you expand on why you – why you would say that, what – what experiences in your life have given you that impression? What are you comparing – who are you comparing yourself to or –*

Well I was never much involved in the research, but I was extremely good at administration, really good. And as I say, you know, at Manchester I knew all the people in maths and physics and all the other people who did the admin, and I knew I was better.

*Is there any link between being good at administration, being good at certain kinds of programming and being good at the repetitive tasks of measuring?*

I don't know, do you think there is [laughs]?

*I don't know.*

I don't [laughs].

*You said last time that you – as a programming language you like Pascal.*

Yeah.

*Now what about – what about Pascal as opposed to other languages makes it likeable for you?*

Just the stage I was at when I learnt it I think to be honest. You know, never really got fond of more up to date languages because I haven't used them much.

*And you – when you first saw the article in The Guardian you said that you – you thought you'd like programming and you thought you'd be good at it, why was that?*

... I think it was the maths teacher we had when I was young, who'd made us lay our work out very carefully and, you know, get all the details of the layout correct and I had the feeling that that would matter with writing programs for computers, and I think it did at that stage, that I'd be good at it.

*A certain kind of neatness and accuracy in layout?*

Yeah yeah, that's it.

*Hmm. Okay.*

[End of Track 6]