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Sir David Jack CBE FRS FRSE in interview with Dr Max Blythe
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Interview 1

MB Sir David Jack, you were born in Markinch in Fife on the 24th February?

DJ 22nd February.

MB 22nd- I'll get that right eventually - in 1924.

DJ Absolutely.

MB You were the new member of a fairly large family.

DJ Well, I was the number six of a family of six, three boys and three girls.

MB And your father was a coalminer in the Fife Coalfield.

DJ Yes, he was. At least I know that from my birth certificate, not because I saw him come home from the mines, because he left the mines due to the illness of miners, nystagmus, I would guess in 1926. So I have no recollection of his being a miner.

MB But when you were born that was his job, and you were just on the edge of the Fife Coalfield?

DJ Yes. Markinch is fortunately placed because it is really in the countryside but on the edge of the coalfields. The industries are threefold. There is whisky - the John Haig factory is there - there are paper mills and there are coal mines, but also in the bargain of course there is good agriculture roundabout, good farming. It is quite good farming country. Do you want to know some more about Markinch?

MB Yes, a little more because it's a fascinating town.

DJ Yes, it's an interesting place of about 1,200 people, which many people down in England would consider a village. But Markinch was not a village; it was a borough with its own charter, its own town clerk and so forth. There were villages roundabout and they were of a few hundred people, but Markinch was a place of great importance - of course! It was close to Dalginch, which was one of the Pictish capitals in Scotland. But, even in the Depression, it was regarded as a fairly prosperous place.

MB A good place to grow up?

DJ A good enough place to grow up, yes.

MB Let's keep with your father a moment, David. Tell me about him because he was a man of fascinating talents.

DJ Well, that's my opinion. A very intelligent man, very well read. If I wanted to know what Walter Scott's book was about or this and that, he could tell me. And not infrequently, I may say, before going to a school exam I would ask him about the main part of Ivanhoe, for example, and he could tell me and that's all I would remember of it. He had several interests: for example, he was a good draughts and chess player and he was accepted within the village because he knew all the managers and so forth, they all went to school together, so he was known from childhood. He would play chess with them and he would play draughts and bridge and so forth and he was invited into this company because he was a reasonable player.

MB And he was a useful cricketer I think at one time?

DJ Yes, yes, he played for Fifeshire occasionally, which I guess is not the same as Yorkshire, but it's still a pretty decent standard. Now, that's a talent I never inherited from him. If there was a moving ball involved, I would find it very, very difficult. Golf, now that's another story. So, that's a bit about my father. From 1926 onwards he did whatever work came his way and if there was a local census for this or that, for example, he would get the work from the town clerk, Billy Hume, whom he'd been at school with. So if there was any job of that kind going, Andrew Jack got the job. He worked in the Post Office… well, at all sorts of things and finally he ended up working for the Haig whisky company.

MB That was the last job of his career, he became a very senior gardener there.

DJ Ultimately he became the head gardener of the Haig Whisky Company; not that he would regard that as a grand job, mind you, but it was the best job for a gardener there.

MB But those Depression years were quite strict times for the family in terms of finances?

DJ Yes, I'm sure they were, but I must admit I was not really aware of it.

MB Because mother was a terrific manager. Was that right?

DJ Well, I think so. She ran the household with not much money coming in. So if your mother is a good manager, you're all right, but that's provided your father is not a drunk, which my father wasn't. So you feel secure and I think you get a good perspective of the value of money because if you have no money, you know that money is not essential for having a good time in life.

MB Talking of mother, because we said father was quite a scholarly figure who was very supportive and educationally a very sound back up, but mother was also interested in your education and did a lot to push you forward. She was a great pressure.

DJ Well, she was the driving force in that, beyond any doubt. Now, her father was the manager of a linen mill nearby in Leslie. An engineer by profession and by all accounts a good one, but in many ways a very stupid fellow really because my mother was intent on becoming a school teacher, but he decided she had to go and work in the mill just like any other girl and so she did. So, one result of that was that she was sure that her family would never be in that position.

MB Can we just put her name on the record?

DJ Well, her maiden name was Mary McDougall Maiden. She grew up in Leslie and my father in Markinch. The families have lived in these places for a very long time. The name Jack by the way is Scottish and it's a common name, not in England, but a common name in Scotland, particularly on the northeast coast

MB Tell me about your brothers and sisters.

DJ Well the oldest, Christine, was probably the most talented in the family. In fact, she set us all a very hard task because Christine was first in everything she did and she went to Edinburgh University and got a double first in French and German.

MB What a hard act to follow.

DJ She must have been a pain in the neck as a fellow student because she got the medal for everything, and she was the same at school. So, my mother came to expect that her family would be first and her attitude was more or less 'Well, who was second?' Unfortunately, when it came to me, I wasn't very worried about who was second because I was well down the pack. But you were asking about her, and she was undoubtedly the driving force in the family to make sure that her children would be educated.

MB We're talking about brothers and sisters though. We've got the eldest sister, now, just going down the line...

DJ Right, okay. The next one, Janet went to Buckhaven High School as we all did, apart from one. She became a dispenser in the local pharmacy and I owe her a great personal debt because it was she who made it possible for me to go to Glasgow University. She did not go to university herself. Andrew, the oldest boy, he decided - and God knows how he got away with it - that he was not going to go to Buckhaven High School and he stayed at the local school in Markinch and ultimately became an apprentice fitter and engineer in the local paper mills. He became a foreman there and is now retired, still in Markinch. Then Mary, who worked for the local printers, became a land girl and married a farmer and lived in the north of Fife. She's still alive and living near Leuchars, a village called Pickletillum, and I'll give you five marks if you know where that is.

MB I'm not going to get those five marks!

DJ She found a place there and they were very happy people although they had to work very hard. Then came Jim who read chemistry at St Andrews. He got a first and was a very bright chap. He worked with ICI on fibres from monkey nuts called

ardole. He invented a process for making polypropylene film, for example, when he was working for BX Plastics. So he was a very inventive chap and a very neurotic one into the bargain, but a very inventive chap and a good chemist. A very interesting man because he became research director of that company and gave it up because he was fed up of training plastic technologists to be recruited by ICI. So, he went back and invented this polypropylene film. Jim was bright, he was the dux of the school and so was Christine. Then the last one was the runt of the bunch, which was me.

MB David, just looking at that family and you settling into it. It sounded a very comfortable family, although I think that you said you never quite knew everybody as a youngster and your parents were a little bit remote.

DJ Well, that's true. If you're the last of a big family, the oldest is grown up, really, and also your parents are significantly older. So, it alters the relationship somewhat.

MB You described it as a person looking in a bit. Is that right?

DJ Well, that had nothing to do with it, that's in me. One tends to be an observer from the outside looking in, if you like. If I ever did a biography, it might be called that, 'From the outside looking in'. I promise you I will never do it. So, one tended to be a solitary person, not necessarily a lonely person, but one tended to be solitary and that's in my nature.

MB What are your early memories of that family life?

DJ They were good, obviously. I told you we felt secure, we were never hungry. We had a large garden and an allotment, so we ate vegetables of all sorts; anything we could grow in Scotland, artichokes and so forth, which the locals had never known. So, we did all right.

MB And you had a house which could warm you at the front from the fire and freeze you at the back?

DJ Well, the house is still there. It was a stone house, a family house. I don't know how old it is, but the walls were a good three or four feet thick. But the windows and doors and everything used to rattle in the wind and there was an old-fashioned black leaded grate. The fire was about this far off the ground, and if you were sitting close enough your front and knees were heated but your back was chilly. There were curtains and all sorts of things to keep the wind out. So, it was an old house, small for the size of the family, but it was a happy house.

MB Very early in your life, you started to play chess?

DJ Chess? Not me! chess?

MB Chess or draughts?

DJ Well, I tried to play draughts, but I was never any good at these things to tell you the truth. I don't know who told you that?

MB But your father was a chess player and I thought you took part in local tournaments with him?

DJ No, no, no, no. I think what I told you was that in the local working men's institute there were some remarkable draughts and chess competitions because they used to invite the world champions to Markinch, and they came.

MB Year in and year out?

DJ Well, every year there was somebody there and he would play one hundred boards. And he would walk around the inside of this and as he went past he made his move, and you had until he came back to think about it. And he used to very easily deal with people like me.

MB But you did take part?

DJ Well, only one Saturday I took part. It would not have been a memorable occasion for him. But there were a number of people there who could play, who had come from Glasgow and Edinburgh to play this man. Stewart was one, a man from Ladybank who was the world champion, I remember, and Banks, an American. But these good players very often had people behind them at the board trying to work out all the moves before the champion came back. But it was a great honour if he came to the board and he recognised that, okay, these people knew what they were about, and he would pass it and he would actually think about it as he went round. So, again, it was something unusual, but it happened in Markinch.

MB Fascinating.

DJ And that was an institute funded by the local paper mill owner, the Russell family. So, they were good enough employers. Paternalistic, but sound.

MB David, I may have been a bit wrong about the chess and the draughts, but I'm not wrong that quite early in life you started to play a bit of golf?

DJ Golf, oh yes!

MB And you took to that?

DJ Well, I think many a time when I was working with my father I should have been paying more attention to gardening or to school, really, because my mind was more on going to play golf or football or whatever. Scarcely intellectual pursuits. The fact is the minute you start to think about golf, you're finished.

MB It was a nine-hole course in Markinch?

DJ Markinch was a nine-hole course of no quality at all. We used to share it with the local milk cows until the greens were fenced to keep the cows out. In fact, I've been chased off the golf course by a milk cow, a bad-tempered Ayrshire!

MB You also said you were trained in some good ways by Willy White?

DJ Oh, Willy White, the tailor, yes. He used to be our mentor. The first message he had for us was how to mark a golf ball. If you ever lost a golf ball you should be ashamed of it because you hadn't marked it. The second thing he convinced us of was to keep trying, because at that time what was equivalent to par was called a bogey - now a bogey is one over par - and Willy used to say to us, 'Boys, to get a bogey at any hole, all you need is one good shot.' And sure enough, it's true, until you run out of shots that is. One good shot can bring you back in the game, you don't give up, the next one you try. And he was a good influence on us. I wasn't an outstanding young player, but by the time I was fourteen or fifteen I was playing maybe off five or thereabouts, which is reasonable and respectable but not good. There were some good players about. So, it was an important part of the social life of the village because, again, everybody played. In Scotland golf was not - it probably is now - but it was not socially conscious. It was a game of the people and everybody played, everybody who wanted to anyway.

MB David, I'm going to take you to school. We've run on a bit with the sport and the leisure because there were a lot of things happening around Markinch that took your attention in those early years. But was Markinch School your primary education?

DJ Yes, Markinch.

MB About 1929ish?

DJ That would be right, and in many ways when I hear of the problems in schools today with children turning out at the age of ten or eleven scarcely able to read or do arithmetic, I assure you that would never have happened in Markinch School.

MB Not in Miss Brown's class.

DJ Miss Brown, the first teacher, she taught us the first rudiments of reading and writing. She wasn't the most gentle of creatures, but there's no doubt at all we paid attention and we learnt and if you weren't learning then she would pay special attention to you. Now, these were classes of forty maybe even fifty people and so she was a good teacher and throughout the elementary school we had a succession of pretty decent teachers, some obviously kind and cuddly, others not.

MB But you got a good standard of education?

DJ Oh absolutely, by the time you came to the qualifying exam I think it was called, in the upper school, literally everybody went through. You had to demonstrate competence in reading, writing and arithmetic, and I don't know of anybody who having come into the school… oh, there was one girl in the whole village who was ESN, educationally sub-normal, who went to a special school, but apart from her the whole lot came.

MB The rest made those basic standards.

DJ Well, I guess it was the schoolteacher and the headmaster, Johnnie Stevens, who was a fiercesome man, but again he had…

MB Was this a school with a strong Church of Scotland influence?

DJ Not really.

MB Was there a strong Church of Scotland influence in Markinch itself?

DJ In the late Twenties when I became aware of this, there was a very strong minister there called John Brydon - and by the way you got your money's worth on a Sunday from him. But he, I think, was a scholar and he also wrote poetry and so forth. But what he did do was that if your family were not in their pew on a Sunday, he was round on the Monday to find out who was ill and if you weren't ill, you went back the next time. He was succeeded by Mr Davidson who was a much younger man, a much more tolerant individual and so church-going became less of a habit, but one nevertheless went to Sunday School. So there's no doubt at all that something of the Scottish Church's attitudes were really ingrained in every last one of us and indeed for me, in a way it's comical and very sad at the same time that one ends up with literally none of the faith but all of the inhibitions, which is a sad position to be in!

MB David, those early school years: were you a shy lad?

DJ Oh, probably yes.

MB That would be a fair description?

DJ Yes.

MB Still looking in. Not having a lot of friends?

DJ Oh, at Markinch School one had friends, yes. It was when one left Markinch to go to Buckhaven when one left behind the people that they'd gone to school with. When I went to Buckhaven, I think I was the only boy from Markinch going to that school.

MB Buckhaven High School?

DJ That's right, and so one lost one's roots.

MB Did you sit an exam for that?

DJ Yes.

MB I think we ought to hear about that. That wasn't your best day?

DJ No, no. I think that was called the controlled examination - it's a kind of eleven plus - and you had to go to the school of your choice to sit an exam. And it was a nightmare because I had a new pen, a 'dipping pen', with a nib and behind the

nib was a special device that held the ink so that you could write half a page with one dip. Unfortunately for me, every time I put this damn thing down on the page, the ink flooded out and I wasn't confident enough to ask them for another pen, and what made matters worse was that Bill Reid - one of the classics masters - who was standing behind me saw my name was Jack and said, 'Are you one of the Jacks of Markinch?' 'Yes.' Then the damn fool stood behind me and watched me performing, blots and all. So, I was a bit shell-shocked and I confidently expected to be failed, as I should have been, I'm sure, but I was let in because I was a member of this family, really. Christine and Jim had been there before me.

MB They'd been head of school and things?

DJ Yes. So they let me in.

MB You gained entrance anyway. So, that was a very selective time, people just didn't move and go to different grades in Buckhaven, it was a very selective process.

DJ Well, to get into Buckhaven School was a sort of eleven plus examination.

MB Bit of a privilege job. So, you get a nice blazer and a uniform and you start to feel up-market.

DJ No, no. There were no uniforms there. In fact, the school colour was black and white and the motto was *Perseverando*, 'By Sticking In'. And I well remember one of the school inspectors coming and he talked to us all later and congratulated the head master publicly on all the people there who were wearing the school colours. Mr Buchanan didn't enlighten him, but what I can tell you is that as this would be in 1938, the colours they were wearing were of the East Fife Football Club, and they won the cup that year, so that's how true we were to the school colours. First things first

MB Buchanan, who you mentioned, was an interesting head?

DJ Well, he was a classics teacher, a Cambridge Blue at football, but we saw nothing of that. One thing was certain and that was that he made sure that you developed as far as you were able to with what potential you had and anybody with any ability, he used to tell you what you were going to do. For highers, he decided what you were going to do and the rule was simply that if you had any ability at all, his purpose was that you do a group of subjects that would get you into any faculty of any university. 'Now, don't argue, that's what you are going to do,' and if you were hopeless at mathematics, then you would do a third language, French, Latin, German perhaps or even Greek. So it was a good academic school despite the pupils, because most of us were intent on not learning; there was a kind of battle and there wasn't a culture of learning within the school, I don't think. There were too many like me and the company I kept.

MB You said you were a bit lazy?

DJ Yes.

MB You were?

DJ Yes. I certainly was and that's still a trait in me. I suspect it's something genetic. But at school the group I kept company with were intent on fighting the system and I was a disgrace really because I never did any homework. I told you some time ago, Mr Cameron, the head classics teacher, when I was in the fifth year and would be about sixteen years old, I'd shown up once too often having not done any Latin preparation and he took me out. I was sixteen, seventeen or whatever, and I got the tawse on my hands in front of the assembled class. I can remember him telling me, 'Jack, you've got a reasonable brain that's going to seed,' and I never forgot that. Cameron was a redheaded Highlander - well with a name like Cameron he would be - but he was a very tolerant man with a gentle smile and he enjoyed the ironies of life. Anyway, I was pleased a few years ago to endow some Cameron prizes, which were for classics and science, which would have brought out his little grin!

MB Yes, it sure would.

DJ A delightful man.

MB So, he was one of the staff who was really an outstanding character?

DJ Well, I think again, before the war, certainly, we would have taken a poor view of it, although we were anti-establishment, if any of our head teachers in a subject had anything other than a first-class degree, 'He's only got a second'. So there has been a change. So, they were talented people but they had enough good people to be a comfort, I'm sure.

MB Just taking in Buchanan and his strong recommendations about what you were going to do. What did he decide you were going to do?

DJ He decided on the basis of school mathematics, because one could knock up a few marks there, that I would go to Edinburgh and I would read mathematics. Luckily for me I came to the conclusion that the Fife Education Authority was fed up of educating Jacks, because they used to have grants and so forth to go to university, and in my case I felt that I wouldn't get one and so I didn't go to Edinburgh to read mathematics.

MB You didn't get a grant?

DJ I did not.

MB You applied but didn't get one?

DJ No, no. It's a longish story. I probably would have got one but I was easily inhibited, still am by the way. What they asked for on the form was the names and income of your whole family whether or not they lived in the house. By that time, Christine, Jim and the others were working and so if I put the sum in of what they were all earning it added up to a fair bit. But you can't ask your brothers and sisters to educate you, so I didn't even bother to apply. I should have applied. In any case, it

was a good escape for me because instead of going to do mathematics where I would have got a pass degree if I was lucky, instead I started work in a pharmacy with Boots in the Cupar branch.

MB I'm going to keep you from that for a moment, David, and just stay with that Buckhaven High School. Have we missed anything about those teenage school years?

DJ During that time my main interests would have been playing golf and playing in local brass bands, nothing very intellectual, and at school I could keep up with the class.

MB Maths and science in particular were the ways you went. Was the science teaching good?

DJ Systematic. A chap called Addi Mackie was a very systematic teacher.

MB Bit by bit you traced through the book?

DJ Well, for example, he used to dictate the notes we all wrote down. Chlorine had sixteen properties, no more and no less as it were, it was as systematised as that. He used to insist to us 'There's a reason for everything, boys.' And he had a thumb permanently bent like so, and every time he said this… he'd done an experiment and he'd dropped yellow phosphorus into concentrated nitric acid, I think it was, and you get pyrophosphoric acid, but unfortunately for him the phosphorus jumped out and landed on his thumb so he was left permanently like so. 'There's a reason for everything,' and he was the living proof of that! But he was also a very distinguished chap, who played centre forward for East Fife for a while, so he was a very important member of the community.

MB Absolutely, the black and whites. Just keeping to that brass band playing, we haven't really brought that in, but that came quite early. You had this great wish to have an instrument and to join the band. Mother wasn't all that keen?

DJ Well, it's true that every boy in Markinch either joined the pipe band or the brass band. I never knew anybody who did both. On the whole it was better for the neighbours that you went to the brass band than the pipe band, but I think I decided the brass band and I wanted to go and get an instrument. I would have been about eight or nine, something like this, and my mother said no. Then finally, having asked her for the nth time, she said, 'Very well, David, you go, but if you go, you stay.'

MB Ah yes, you keep it up.

DJ And after six months like most other boys I was fed up with it already, with no way out of it, but one had to continue. I was grateful for that because you start to make progress and you find you can read music. And although one would never be a good player, you played well enough to enjoy it and also to play well in the band, and you learned elementary musical theory, even a little bit of harmony and maybe even composition. We had a very wise old conductor, John Haldane, who was a delightful man.

MB And he looked after you all?

DJ Yes, yes.

MB Concerned for your development as musicians?

DJ Right. Well, I think he had a soft spot for me because he even took me to St Andrews to play golf. But, a very good man and very musical.

MB How did you get started with the euphonium, David?

MB Well, that was the only instrument they had. The euphonium was about that size and I was about that size! It was a large brass, dented, soldered euphonium. So, I took it on but within a month they took pity on me because I think they were afraid I would be exhausted carrying this thing. So I got something smaller, I got a cornet. But, as I say, it was quite fun and a very useful broadening experience for me because my life in Markinch as a boy for the most part was how far I could run and get back the same day, which meant a sort of four mile radius. In fact, I was in Sydney, Australia, before I was in Aberdeen, which was about a hundred miles up the road. Aberdeen might as well have been the North Pole. So, brass bands took me to Glasgow, to Edinburgh and even to London immediately before the war to play in the championships. So, it was a narrow but enlightening experience.

MB A great interest in music that was to remain as well.

DJ Well, yes.

MB You still have a trumpet?

DJ I have a trumpet, yes, but it hasn't seen the light of day for a while. By the way, I used to play in a brass band, the Tullis Russell Paper Mill Band or the Tullis Russell Prize Silver Band to give it its full title and glory. Then I used to play in a little jazz band for dances and suchlike.

MB That was in university years, is that right?

DJ Well, before and after. When I was an apprentice pharmacist I earned more in a night than I did in a week!

MB That was a group that had a rather curious name?

DJ Well, we were the Four Aces and the only thing that was odd about us apart from our idiosyncratic playing was that there were five of us and I was all too aware of who was not the ace. But we were poor and I think we would be remembered only by the people unfortunate enough to have heard us!

MB David, we're going to take in now the transfer of you from school to this apprenticeship which you had to take. Was that seen as your way to university eventually?

DJ Absolutely, because there was a system then that I learned from Janet, who worked in pharmacies. People going into pharmacy served an apprenticeship and you got stamps on the card or whatever it was, insurance card or an employment card, and you got enough after two or three years to get the dole if you were no longer working. The system for students of pharmacy then was when they went to college they got the dole, or unemployment benefit, for those who don't understand the dole, and when the summer came you had enough work for two or three months and you got another lot of stamps that would get you dole for the next session. Now, that was great in principle for that was my way to get to university and I decided ultimately to go to Glasgow because they did a degree course in pharmacy there, and I went to Glasgow sure enough. They used to keep their employment exchange open on a Friday evening to pay out to students - there were a few of them - and I got it the first week I was there, but the second week a fool of a person offered me a job and I said, 'I don't want a job,' and I was marked down as not available for employment and so I didn't get the dole. And by the way, this is not untypical of my life that 'the best laid schemes of mice and men...' and that was so in my case. So, my sister, who as I told you came through from Edinburgh, cared for me while I was there.

MB Did she set up home for you?

DJ Yes.

MB In Glasgow?

DJ In Glasgow, yes.

MB For the whole four years of that course?

DJ For the whole four years of that course.

MB David, we're pushing ahead a bit going to Glasgow on a university course right away, but that apprenticeship in Cupar with Boots, those were three or four really important years. They were wartime years. I think you went there in '41. Is that right?

DJ Yes, they were important years in a way because first it was a way through to university, and second one learned a fair bit about important things. To start with a trivial example: I found out within the first week that I didn't want to do this for a living because when the first job you are given is to take a duster and dust the bottles all the way round the shop, it's a bit like the Forth Bridge. The other job the apprentice had was every morning you washed the shop windows with one of these long poles with a brush on the end. Now, I'm sure there's an art of using these, which I never did quite find, because you dip it in the pail and you put it up, and I never did find a way of stopping the water from running up my arm, despite the fact that the washer on it is supposed to stop that. So, I learned how to clean windows and how to make use of chamois leather to make shiny windows. Also, that was a humbling experience in a way because we were opposite the council buildings, where all the nicest girls worked. And a byelaw in Cupar said windows had to be cleaned before 9 o'clock. So there was I washing windows before 9 o'clock, with my chances no good at all with the local girls, and the only small chance that was left was diminished

further as I had to deliver messages and prescriptions on one of these bicycles with the big wheel on the back and the one on the front with a basket. Well, it gives one a good perspective on life, shall we say.

MB You were into girls by then?

DJ Well, not to any great extent. I'd like to explain to you, I was a very shy boy to tell you the truth, but very civil in the shop. I remember being described once as 'that polite boy in Boots', so there you are.

MB And there you did lots of washing up and all kinds of basic jobs?

DJ Well, Tuesday was market day and I used to deliver seed dressing, sheep dip and all sorts of things and I came across a fair amount of remarkable characters who were the local farmers. So that was worthwhile. Luckily at this time, dispensing in Scotland meant that each prescription was prescribed individually and it was made individually, so there was no question of making up big stock mixtures. The doctor used to vary his recipe according to the patient, so that bottles of medicine were each individually prescribed and individually made. Secondly, one had to make pills for example.

MB People have forgotten how to do that, haven't they?

DJ Well, pills are never made nowadays, but then one had to make pills. Powders were also very popular then and we used to make and fold hundreds of powders every day - you could do them blindfold - so one learned dispensing quite well. That was reinforced by the visit of the Boots territorial general manager who visited regularly to make sure that the correspondence course we were doing with Boots headquarters in Nottingham, we were playing our part in and doing it right.

MB So, you were part of a correspondence course training?

DJ Absolutely, and in fact the forensic pharmacy part of that was better than the university course that I subsequently went to, and by the way that would not have been difficult, but it was an excellent course. Similarly, dispensing was first class. But A G Ironside, who was the territorial general manager, came - he was a Plymouth Brother, by the way, and a severe man in some ways. But he examined the pills I had made and so forth by way of test exercises to make sure they were right, and if they weren't right, of course, they had to be made again, and he would do it and then see them the next time. So, he set some standards for that. The apprenticeship period I wouldn't say was a profound period, but one learned something about oneself and one learned one or two useful things.

MB The territorial general manager you mentioned, he really was an influence because he set standards and he made an impact on you by always taking an interest in what you were doing as an apprentice?

DJ Yes.

MB That was quite important.

DJ Also, as it happens, the Boots connection was a good one because, I forget how many branches they had then - we were number 627 I think it was - probably about one thousand or more branches. Each year they used to hold a bursary competition for people going through to college and it was Ironside who told me about this, and so I went down to Nottingham to sit this exam and I got about £100, wealth beyond the dreams of avarice! And the next year was the same. Again, that was important because since I didn't get a grant we were pretty hard up. So, sitting competitive exams is a good discipline if you have to be in the first one or two, and for that wee while you tried.

MB You really worked for awards?

DJ Oh yes.

MB David, you said that also for this shy boy there was a coming out and that you enjoyed being on the counter serving and meeting people. That must have been an important step?

DJ Oh yes. Well, I enjoyed the counter work probably because it was less boring than down in the cellar washing bottles, but one met a fair number of different characters. No, with the counter work one was in contact with the community and there's not much of that down in the cellar. So, I wouldn't say they were the most enjoyable years of my life, but they were necessary.

MB Boots at Cupar was influential. So, you go to Glasgow and that was well planned ahead at that time?

DJ Yes. I knew there was a degree course there; the other places just did a diploma. In any event I was lucky because by the time I got there there was a pharmacology speciality option, so I finally ended up with joint honours in pharmacy and pharmacology.

MB Right. Take me through it. It's a four year course?

DJ Yes.

MB Can you take me through those years?

DJ Well, the first year in the Scottish university then and now, I do believe, is really a course more or less equivalent to A-Level in England, probably a little bit more difficult.

MB You said the fees were a bit shocking when you first got there?

DJ Well, that depends on how much you got. I don't exactly remember the fees. I think it was something like £29 a term or something like that, and at that time I had about £52 and a bit in the Post Office Savings Bank, what was left of the £100 or whatever it was, and I think finding the fees of about £150 a year or something like that was a very major thing. The Carnegie grant covered part of it, The Carnegie

Trust in Scotland. That was the first time, by the way, that I knew that money was important, that you had to have enough to go on.

MB Did that Carnegie grant go right from the first day?

DJ Yes. Every student going to a Scottish university could apply to Carnegie and there was a minimum grant of something like £50, which went towards fees, provided you had to pay fees. So, the first year for us was chemistry, physics and biology. Two things I learned there and the first was about examination technique. I well remember the first exam I ever sat there in chemistry. It was on the Periodic Table and I knew a bit about it and had prepared for it, and it was the worst mark I ever made because I spent so much time on it that I had to scramble the other questions, which was absolutely dotty, but that much I learned. The second thing I learned by the way is that it wasn't quite like school, you had to do a wee bit of work to keep up.

MB Although you did confess that in some terms you did two weeks work at the end, to recover from eight weeks of fairly comfortable living?

DJ It's true that I was never a very systematic worker, but I could learn quickly and forget equally quickly - and unfortunately the forgetting is more competent now than the learning - but one could do that. In any case, the first year turned out to be quite important because I got an award called a governor's scholarship. There was one for degree students, of which I was one, and another one for diploma students, and the merit of this, although you got a prize and so forth of books, more importantly you were exempted from fees for the rest of your course.

MB For the whole course?

DJ Yes, and that was again very important.

MB You were home and dry then virtually?

DJ Well, particularly with Janet looking after the home, and then the £100 from Boots was again beginning to be…

MB David, we should actually pinpoint where you were because there was the Royal College of Science and Technology and there was the University of Glasgow. Where were you based?

DJ There was then the Royal Technical College, which has turned into Strathclyde...

MB Strathclyde University, yes.

DJ It was transformed into the Royal College of Science and Technology when polytechnics were established and so forth, but it is now Strathclyde. The degree that we were awarded was a degree of Glasgow University. The first year we did in the Royal Technical College. After that, physiology, biochemistry and pharmacology were done in the University, and chemistry and pharmacy in the Royal Technical College. And as I think I told you, the timetables were such that we spent one third of

our time in the tech, one third in university, and one third on the bus because we used to yo-yo up and down between the two establishments. But the degree was of Glasgow University. Now, in the physiology and biochemistry year, much to my surprise because...

MB Yes, that was a bit of a surprise, wasn't it?

DJ …I got the medal for physiology and biochemistry in the medical school and it was the first time that it had ever happened, and it was the last time because immediately after they found out I was not a medical student they gave the medal only to medical students, but it was a surprise.

MB The dean wasn't all that happy?

DJ Well, probably not, otherwise they wouldn't have changed it.

MB I think when they awarded it, they thought you were a medical student and congratulated you?

DJ Oh, that was Cathcart, the professor of physiology, Edmund Carthcart FRS, a delightful man but a most eccentric fellow really. I well remember being called to his office and his office was worse than mine - I file on the floor and he filed on the floor and every other place you could think of. But I remember him congratulating me and he wished me well for the rest of my medical career and so on, so I said, 'I'm a student of pharmacy.' 'What? - Well done!' He was a lovely man. The only problem I ever had with Cathcart was as a lecturer, and by then he was seventy and no longer the chap he once was, and frankly you couldn't believe a word he said. He did me another great turn because many of my colleagues as fellow students used to go to all his lectures despite the fact they weren't learning anything - university attendance was not mandatory - and so I used to go to the library instead and make my own notes because there was no point in going to listen to Edmund Cathcart in his dotage really. But no doubt Cathcart in the first war had a major influence on the nutrition of the British people, and I'm talking of a great man who stayed too long. Professors in Glasgow then seemed to go on, and I believe it is true that in the statutes of the university there are grounds written down of conditions under which lecturers or whoever could be dismissed and there was unsoundness of mind and all sorts of things, but one of them was moral turpitude. So for an ordinary lecturer or reader or whatever, it is moral turpitude, but for the professor, dispensation for persistent moral turpitude, which is a lovely thought! So, there are some benefits in being a professor after all.

MB David, who were the good teachers in those early years. We've talked about Cathcart not being quite at his best?

DJ Well, the professor of biochemistry, Wishart, was a good systematic teacher since we started there. In chemistry while I was there, Professor Spring came, Max Spring, I think from Manchester. Now, he was the only truly brilliant teacher I had.

MB Bit of a role model?

DJ Well, I don't know about a role model but certainly I was flattered to be invited to do a PhD in chemistry with him, but I turned him down to continue in pharmacology, which was probably a mistake. But he taught a course in heterocyclic chemistry and again we sat in on the honours chemistry course, but it was utterly brilliant, with π electron excessive and π electron deficient systems, so he was a very fine teacher. Who else? There was a chap teaching statics/dynamics in the first year, again an excellent teacher, but not so many. Many highly competent people: people who were different and interesting.

MB What I was trying to pick out, David, is that in that period it seems you became quite a hard worker and a more concentrated worker. You really did know what work was about by then. You said you'd had a fairly lazy and comfortable school career. In those first few years, something seems to have happened because you did get rather consistent in achievement?

DJ Well, you have to try some of the time, you know, and certainly at school one could keep up with the caravan, if you like, at really a pedestrian pace.

MB Had you started to see a career ahead at any time. I mean, you said you weren't going to go back to the shop?

DJ Not really. I well remember, but I don't remember why I said it, saying to Cecil Gray, who was a fellow pharmacist, that what I hoped, because I felt very uneasy at having escaped wartime service, that I would like to put something back and the only way I could do that was through research. Now, these were just words, because I had no idea what it meant.

MB But missing the war did leave its mark because you did have a great sense of guilt?

DJ Well, I don't know about leaving a mark but as I say I was uneasy, I can put it no higher than that, and then I was called into the Army after the war for National Service, but that's a different thing.

MB We'll come to that soon. We might just mention that one of your brothers was at Dunkerque, is that right?

DJ He was at Dunkerque and North Africa and then back into Italy, I think. So, that was different and the only reason that happened to me… otherwise I should have gone to university and probably had the same sort of career, because people who went through short-term university, on the whole they went into industry and so forth, but it was a mistake I believe not to have been in the Army at that time, but I've made many mistakes in my life. That was one of them.

MB David, one of the mistakes that you didn't make, you started walking out with a young lady in that year and by the second year you must have been thinking ahead towards marriage even?

DJ Well yes that is true, except it was a very long thought process because we were married I think in 1951.

MB Yes, but it all started there in the Forties?

DJ Yes, yes.

MB Lydia.

DJ Lydia has always had something to do with voluntary organisations. Let's see now, what was it called? I don't know. I forget what the name of the organisation was then, some sort of cadet corps. But I remember her walking into the physics lecture theatre and I was at the back - latecomers used to come in the back door - and I saw this girl come in with her hat on and so forth, a uniform of sorts, and I thought 'Oh, a nice looking lass,' but it was a slow business.

MB That was Lydia Brown?

DJ Lydia Brown.

MB Lydia Downey Brown.

DJ Lydia Downey Brown, quite so.

MB And you got to know each other quite quickly. That was a relationship that went the full course?

DJ I wouldn't say quickly, but it was a different time with different values. As I told you, I was a rather shy fellow and still am for that matter, and I still find it difficult to go into mixed company or company I don't know. But I was certainly a very shy lad and Lydia was no more forward then me, so these things take time. But a good and civilising influence on my life, then and now. She kept up her interest in the Girl Guides for example, she was president of the Girl Guides for Hertfordshire, before that she was county commissioner and before that she ran, as I know only too well, all sorts of Brownie troupes and what have you. The only thing I know about it is that one used to be the labourer at the jumble sales you know. If you were selling an old chair for half a crown. 'Do you deliver it?' - 'Of course!' So that was my job, delivering stuff from jumble sales. That was my only contribution.

MB A very able partner. David, just staying with the early part of that partnership in the university years, we've got you through year two with a medal in hand and you've got a governors scholarship. Now, you're moving to years three and four. Were they the real pay off years?

DJ Well in years three and four, you see, most of the chemistry was done and Spring was involved in that. Year four was the honours year and then I specialised in pharmacology and pharmacy. So, they were useful years and that's all one can say. Frankly, the teaching of pharmacy was poor at that time: it's good now. And the teaching of pharmacology… I was in a class of two, and I'd better not name the chap concerned, but one ended up self-taught and many inadequacies in my quantitative biology date from then, I'm sure, because I didn't have enough energy to make good this quantitative side. So you're looking at a very qualitative scientist.

MB Did pharmacology capture you quite early?

DJ It was certainly interesting.

MB It was growing up wasn't it? It was a young science.

DJ Well, it's applied physiology really: what can be the therapeutic consequences of what you know about the body's resistance. Very interesting indeed. I was always uneasy though about using animals and indeed that was one of the reasons why a few years later I gave up pharmacology, because if you look at a mouse and see a fellow suffering creature, then it's time to stop. Nevertheless, it is essential. In fact, I was ultimately the chairman of the Research Defence Society, which has to explain to people why animal experimentation is necessary, and it is still necessary, but it's not for me. So, then one moved on to other things. Well, I moved first back into pharmacy and then into chemistry.

MB And we're going to take you to that. We're going to wind down for a moment and come back with that next step in mind.

MB David, we've got you to the end of your four year degree in Glasgow. You didn't choose to do a PhD, you've made that clear in the first part of our talk, what was next?

DJ Well, I didn't choose to do the PhD in chemistry with Spring. I was reporting to a very wise man, Professor Stanley Alstead, who was a professor of medicine and a professor of materia medica. His best known work as far as I'm concerned - he was a very educated man - was the medical knowledge of William Shakespeare. So writing for Alstead was a problem because he used to correct the spelling, the punctuation or whatever, so again it was a discipline. But he took me to Stobhill Hospital; I remember, I was an assistant lecturer in pharmacology, and he showed me two wards with many people who'd had a stroke and others with Parkinsons disease and there were many elderly people there, and that was it for them. They simply stayed there and they occupied the ward and he said to me, 'David, these are the kind of people that you must try to help.' After a stroke or what have you, you can have a spastic side, a paralysed side, and so I set off to find if I could find some new kind of muscle relaxant - a problem unsolved by the way, because how you relax the spastic side without making the other side unusable I don't know. But my PhD was going to be in that. So, I was teaching pharmacology and started in a half-hearted sort of way…

MB That was an assistant lectureship?

DJ That's right. In any case, after a year I was called into the Army, which again was a blessed relief because there I was on my own, the only pharmacologist in the place, and if you had to teach yourself from scratch without contact with other people of your own kind, then it's a silly and impossible position to be in. So again I was

lucky and I went into the Army for eighteen months, which was a good experience really because I ended up teaching at the Army School of Health, teaching army dispensers and also Queen Alexandra Nursing Corps tutors. They had to go for a tutor's exam and one had groups then to bring up to some sort of speed in chemistry, and they were highly intelligent people, very able people, and so by the way were some of the Army dispensers. So, that was quite an interesting period.

MB David, I think you took the choice not to become an officer?

DJ Well, that's true. I was saving to be married and as a pharmacist I could be a sergeant within x weeks if you like, whereas at the officer cadet school, well, you become a second lieutenant after whatever, at half the pay of a sergeant, so no problem there for me. But I found it quite amusing because on the basis of whatever aptitude test it was they did, they suggested I go to officer cadet school and I said, 'Well, I'm sorry, I'm not sure I want to do that.' Now, in the Army there's a form for everything and there's a form for when you renounce any right you have to go to officer training school. I found out later that the Army even had a form for rupture trusses because some had got lost in the medical store I was looking after in Edinburgh, and in order to write them off we had to fill in a special form. There's a form for everything. But the Army in peacetime I'm sure is a very different thing from an Army in wartime because in wartime there's a sense of purpose and peacetime it's totally different.

MB So, you're marking time a bit but making sergeant's pay?

DJ That period gave me time to think about what do I want to do, so after that I went back into teaching with James Todd. Now, he was the professor of pharmacy and again, for me, a father figure. He was very kind to me because when I was an undergraduate he put lots of demonstrating work my way. He knew we were hard up. So I used to demonstrate physiology and biochemistry instead of attending the pharmacy laboratory, but I was none the worse for not going to the laboratory, I may say, at least as far as I could make out, and again one was earning cash where one could. But in any case, Todd very much wanted me back and so I went back and I taught physiology and pharmacology for one year.

MB And that was at the Royal Technical College?

DJ Yes, and the people I was teaching were graduates in pharmacy. I also taught a course for people who were reading food technology.

MB But you said it wasn't satisfying?

DJ Well, teaching itself, as you know, is good fun if you have a responsive class at all, but I must admit I did not enjoy reading and putting together lecture notes simply to tell somebody else about it. And if you're on your own again you've taught literally the whole of the course, so the first year you spent most of the time reading and doing lecture notes. Now, that, if you're idle as I tend to be, is not a good way of living as you're on a treadmill of sorts. In any case, within a year I knew I no longer wanted to be involved in experimental pharmacology, so I left Glasgow. By the way, I did start PhD work there; again, a good starter of things but not a good finisher. I

started work there on trying to isolate bacterial pyrogen because up until then much of the work on bacterial pyrogen had been really phenomenology. You were really injecting extracts of this or that into rabbits to see what happened to the temperature. Now, it seemed to me a pointless waste of time. If you're going to do anything about pyrogen you have to isolate it, characterise it and if possible determine the structure. The first thing to do was to isolate it. So I set off to reproduce some work done by a pair in Nottingham, Morgan and Partridge, who had isolated lipopolysaccharide from the *Shigella*, I think it was. And I thought okay, we apply that, because they vaccinated the organism, and I said if we do that on a pyrogen-producing organism, which included shigellas, then pyrogen will be in one bit or the other. And it was the right way to do it, in fact, because it turned out Morgan and Partridge years later did it for themselves. So one was on the right track there. But again, after one year I'd had enough.

MB Didn't you apply for a job? This is 1951 we've got you to.

DJ Well, in fact Dr Tom McCraig, who was the research director in Glaxo, was a friend of Todd's and when Todd knew that I was intending to give up pharmacology… and he wanted me to stay on as a lecturer in pharmacy. I said, 'Look, I've no experience of pharmacy, I can't become a lecturer. I'll go into industry if I can for a few years experience and then I may be in a position to do the job well.' And he introduced me to Tom McCraig, a fellow Scot, an interesting man, who had been the chief adviser on nutrition to the Air Force during the war. In any case, Tom, another father figure for me, he asked me to go into Glaxo and I joined their pharmacy research department.

MB That was at Greenford?

DJ That was at Greenford in 1951.

MB So, you come down to the south?

DJ I came down to Greenford, yes.

MB Was that a culture shock coming to the south?

DJ Not really.

MB You'd already lived in Hampshire?

DJ That's right. Not really. I think going to Bangladesh or something would be a culture shock, but England is not quite the same thing. Maybe a culture shock for some people.

MB Was Glaxo a bit of a culture shock?

DJ No, no. I only stayed there a couple of years at most for the very simple reason that I'd concluded there was no future for me in Glaxo in the pharmacy department. I had a reputation there in the pharmacy department as being a chap obsessed with theory because if I was formulating a suspension of say, soluble

penicillin, then I used to measure not only particle size but surface areas, surface tension and surface energies, because you were looking for a particular kind of distribution of particles, if you like, so they would stay in permanent suspension. Now, that for the most part had been done by trial and error and I could see no point in doing that because you didn't know what you were doing.

MB You were an equations man?

DJ Well, I don't know about equations but certainly I like some understanding of the systems that I'm working with, and so one ended up learning a fair bit about the surface chemistry of powders, of suspensions, which stood me in very good stead later when we were formulating pressurised aerosols, dispersions of solids in liquids. In fact, one of the early publications of mine is a simple paper called 'Pharmaceutical Dispersions of Solids in Liquids', which was published a long, long time ago.

MB What job did you actually take at Glaxo? What was the actual title of the job?

DJ I worked on the bench as a pharmacist formulating penicillin suspensions, streptomycin formulations and so forth. So, mostly antibiotics I was concerned with and it was useful because one learned about how to do stability tests, sterility tests, formulation of solids and, as I say, formulation of liquids and reaction kinetics for determining likely shelf life of things. So, it was useful except that it was not very interesting. My motivating force very often is boredom and I used to move then. If I was in somewhere and I was learning and things were interesting and going forward, great, but if you find that you are no longer learning or you are not interested you move on, and you can do that until you're forty.

MB I think you had a rather curious head of the unit there?

DJ Oh, Bill Woodard, yes. Well, he was a former Army sergeant I think during the war, a most industrious man, conscientious man, but not to put too fine a point on it, a rather stupid man and also a bully.

MB You said whatever he chose to do, go in the opposite direction and you'd probably be right.

DJ Well, that was not in a scientific sense but in man management. There were two men I met in my career in industry who were bullies and restrictive bullies at that, because the bullying didn't help, it made matters worse. It didn't make people do the job better, it made them do the job worse and if they can't recognise this, they are singularly stupid people. So, I learned from Woodard above all how not to handle people.

MB Pretty important lesson.

DJ But I'd learned before that how to get on with one's fellow human beings when working as a labourer in the paper mills, for example.

MB Yes, because you used to labour during the summer vacations?

DJ During the summer holidays to earn a bit of cash. The only question I ever asked people for work during the holidays was not what, but how much? And working in the paper mills was instructive because you learned about paper technology, but aside from that, because I was a labourer all I needed was a pair of clogs, trousers and a fork and I spent all summer shovelling. But the people around me, I think I told you, really, they vary in characteristics: you get honest ones and less than honest ones, you get bright ones and less than bright ones, but the spectrum of people I saw there was not very different from the ones I saw ultimately at Glaxo. Given the circumstances, they could have reversed places quite honestly. So, there are people wherever you go and you find you can get on, provided you don't attempt to dominate them, and in my case provided they don't attempt to dominate me. That I won't put up with. So, in any case, Bill Woodard did that and we were not the best of friends.

MB He also gave you your first experience of troubleshooting?

DJ You've obviously done your work on this. As I told you, he thought I was obsessed with theory. There was a problem with manufacturing in the factory and he looked around and there was nobody about but me and he said, 'Jack, I'm going to have to send you up there, but what I want you to understand is don't you bother finding out what's wrong, just you put it right.' Literally. So, both as a scientist, but above all as a man manager, he was appalling. So, if there was a human problem in any organisation I had to deal with - mind you I didn't consciously do this - I thought of what Woodard might have done and did the opposite, then I knew I was moving in the right direction. Buthe was that daft. In any case, I only stayed two years with Glaxo.

MB You applied for a job this time?

DJ Yes, I applied for a job as a senior development chemist in a small English company in south London. The company was called Menley and James and they were the agents for Smith Kline and French, they were the agents for the Norwich Pharmacol(?) Company and they were the agents for the people who made Carter's little liver pills, for example.

MB Where were they based, David?

DJ They were based in Coldharbour Lane near Camberwell Green, just backing on to King's College Hospital.

MB Was it a relatively small outfit?

DJ Yes, but one learned a lot there. Anyway, at interview I remember being asked, 'Would you be happy if you learned a bit of formulation. Would you be happy if you had to make the chemicals you formulated?' 'Yes.' 'So that would be all right?' And they were not joking. It turned out that I had to make the first one, nitrofuryl-β-chlroyl propionate. I remember it well, starting with furfuryl aldehyde and really I was nonplussed.

MB You got into the cookbook methods of it, did you?

DJ Well, there was a standard work on furan chemistry called Dunlop and Peters[1] at the time, it's probably still there, a huge tome.

MB You start with wheat in that process, don't you?

DJ Yes, that's right, furfuryl aldehyde comes from wheatgerm. In any event all I can say is that thanks to Dunlop and Peters within six weeks, I think, I had 30 grams of this stuff in a bottle and the lab showed every evidence of it, including stains on the ceiling and all sorts of things. But if you are nitrating furans and things get out of control, there are two things you must do, you turn off the heating and you go out of the lab and you end up with a cinder block and stuff on the ceiling. So, I wasn't the greatest experimental chap that ever was, but in any case on this occasion I did get the stuff in a bottle. Now, that gave me some interest in chemistry and I ultimately did a PhD in chemistry at London University on the chemistry of the aminohydantiums because an important part of one of the major furan nitrogen antibiotics was nitrofurantoin, a urinary tract antiseptic, and the key intermediate to that was one aminohydantium, which was made by a process which gave about a twenty per cent yield. I won't bore you with the details, but the problem was in the first stage we were dealing with hydrazine interacting with the chloroacetic acid, and you got disubstitution instead of the monosubstitution you need, and in order to overcome that you used to need a huge excess of hydrazine, which unless you know what you are about is a dangerous material. I was asked to look at this to improve this process and I looked at the process and, literally, I decided not to try and improve that process at all because they'd had an explosion with it in Lyon at Leefer Company and we nearly had one down in Tunbridge in this country. So I decided we must find another way of making this stuff. I won't bore you with the details again, but in a fairly short time we had a process for making aminohydantoin that gave eighty per cent yields instead of twenty per cent in a one stage synthesis. So, I enjoyed that.

MB Was this part of the work on which your PhD was based?

DJ Well, I used that as a starting point. I had a running jump into the PhD because here was a new synthesis altogether capable of making many substituted hydantiums and other ring systems, so one used that as a basis for a PhD.

MB David, just putting everything in timescale perspective now, you went to this job at Menley and James in 1953?

DJ Yes.

MB And you got involved in these syntheses and this chemistry in a big way in the next eighteen months?

DJ Oh, rather more, about three years or so.

MB And did the PhD start in that time?

[1] Dunlop, A.P., 1953. *The Furans*.New York: Reinhold Publishing Corporation.

DJ Yes.

MB And who was your supervisor?

DJ My supervisor was Professor Arnold Beckett who was a very good medicinal chemist in Chelsea. In fact, he was a professor of medicinal chemistry in Chelsea and he ultimately became very well known because he turned all analytical and was the chief adviser on drug testing at the British Olympic Association. But it's a pity he went that way because he was a very good chemist For example, when the absolute structures of morphine analogues as analgesics were being determined, and these were alpha and beta prolines, Beckett's view was in conflict with the world experts, but when X-ray crystallography came, Beckett was right and they were wrong. So, Beckett was a considerable chemist, but he had no influence on my PhD at all, other than that he was kind enough to be my supervisor from the point of view of London University.

MB It was taking shape in the laboratory at work?

DJ Well, by that time if I didn't know about hydrazine and hydantoin chemistry, then we were in trouble. I thought highly of Beckett because he was in his day an excellent medicinal chemist

MB Just taking stock of where things had got to. How about you and Lydia? Were you married by this time?

DJ We were married in 1952.

DJ In that second period as a lecturer?

DJ Well, I went to Glaxo in 1951. I think we were married in 1952 or '53, one or the other and then she came down. She'd specialised in pharmacognosy in her final year and taught in Glasgow. Pharmacognosy, for those who are not familiar with it, is really natural or vegetable drugs based on plant or resinous or whatever material, so she was really an applied botanist When she came down she got a similar job in Chelsea College and that was probably just as well because I think when she came down she found it a cultural shock because she was away from her family and so forth and maybe lonely. In any event the thing worked out and she came down in 1953, I think it was.

MB Where did you live at that time? Were you living in town?

DJ No, no. We lived out near to Greenford in Rayners Lane. I used to cycle to work from home and Lydia had a much more difficult run up to town. By the way, when I moved from Greenford to Coldharbour Lane that was an interesting journey. In fact, I took two tubes and two buses or whatever. I used to be a bit like one of Pavlov's dogs when I was coming home in the evening. I could go to sleep and wake up nearly always a station before Rayners Lane, occasionally one behind, but I had a Pavlovian response to that. But that's a long time ago. Now, that was a useful period for me with Menley and James because, as I told you, they were the agents of Smith, Klein and French and I would guess within two or three years Smith, Kline bought the

company. In fact, if you are the agent of a big company and most of your business depends on it, you are in a hopeless position when it comes to takeover because they make you and your shareholders' offers which they cannot refuse.

MB You were there for eight years and quite early in that period, after that synthesis kind of bonanza, you got involved in those hundreds and thousands. That was an entirely new concept, I believe?

DJ That was not my concept. That came from a chap called Don McDonald in Smith, Kline and French.

MB But you got involved in the waxes?

DJ That's right. Well, we did all sorts of formulations and I did most of the chemistry myself but with pharmaceutical formulations. The first person I had was a young pharmacist, Jean Bell, who still lives in Welwyn Garden and Jean did much of the pharmacy. The bit of pharmacy she didn't do was concerned with so-called slow release preparations for drugs which are relatively short acting. You try to make them long acting by coating them with waxes which were slowly permeable to water.

MB Those kind of little balls you produce and you produce a layer round of slow releasing wax membrane over the top?

DJ Inside was a sugar crystal, caster sugar, and you coated the drug onto that and then you coated these hard pellets with a waxy outer layer. And the physical chemistry of fats and waxes then was well worked out to a degree, but it was much more complicated than you would imagine. Glycerol stearates for example, there is usually only one stable form, but if it comes out of the solution quickly you have the unstable form which sooner or later reverts to the crystalline form, or the stable form. And, as I explained to you some time ago, the bloom you see in chocolates in the shop window is a polymorphic change from unstable glazes to crystalline material and that's why you have this surface bloom. But the same sort of process happened on these capsules and when you move from the less stable to the more stable form, the more stable form has always more depth, so here you have waxes contracting on a rigid core and that is bad news for the core because two things happen. The first is that it contracts and then becomes less permeable, so the release state of the drug changes, and the second thing is if it contracts enough it cracks and the whole lot comes out at once. So the problem was how to get a coating of waxes to be sufficiently stable under ordinary conditions to give you a stable release rate. Again, one set about measuring things: spraying films of wax on to slides and measuring light transmission because if the crystal structures have a polymorphic change the transmission of light changes. And so one was looking at using glass slides and if it was stable on the glass slide there was a fair chance it would be stable. So by such methods one was able to devise either one of two things: controlled conditions whereby you could allow these changes to occur to a predictable end, or to use coatings although they're not stable. You see the melting point of the coating was so high that at room temperature you had a means of stable condition. So, that was probably the most interesting pharmaceutical problem I dealt with at that time.

MB You provided the whole theoretical basis. The Americans had come up with the idea and you provided the theoretical basis.

DJ I provided part of the theoretical basis for it. Other people in Philadelphia were also working on different things. Certainly, the notion that the problem was one of polymorphism, and fats and waxes in this country came from an analyst called Jack Cross and myself.

MB What I was coming to, David, was that you were by this time cracking really important problems?

DJ Well, they did matter from the point of view of the company because it meant the difference between having a product or not.

MB Well, you'd been wondering about a career and you'd moved into industry and I was wondering, by the mid Fifties and into this work, whether you'd begun to be certain that you career was going to be in developing methods for the pharmaceutical industry?

DJ Well, a career was certainly going to be in the pharmaceutical industry because these were interesting times and also Smith Kline were kind enough to add a bit of pharmacology and we had very rudimentary research going which never yielded anything, I may say, but that's another story.

MB But did you start that research?

DJ Yes. Strangely enough, we were on to the use of substituted phenolacetic acid as anti-rheumatic agents similiar to Boots' Brufen, and I know and I learned later that Boots were very worried about our activities, but we weren't clever enough to see what we had maybe. But that was also very much a sideline to the development. My job as head of product development was to get compounds and medicines either licensed or found in Philadelphia and turn them into products that we could sell in Britain and Europe. Now, for eight years I was with Menley and James and Smith, Kline, and again one moved on for the very simple reason - an arrogant reason really - but by then I knew how to set about pharmaceutical development and it would be more of the same - different but the same - if I stayed there in development. So luckily for me I got the offer of a job as a research director in Allen and Hanbury's, which was a division of Glaxo.

MB I'm just going to keep you there for one moment, David, because you've talked about product development. That must have several arms as a field. I mean, you must relate to marketing?

DJ Yes.

MB You must deal with the processing at the factory level? Can you just put it into perspective for me please?

DJ Well, the only contact that a drug company has with the patients is the product they put up, the tablet or whatever it is. So, it has got to contain the right amount of

drug and it must deliver or release the drug to the patient in a reproducible way so that when they take one tablet, the next one is not that different. So, what you have to do is devise formulations which meet these conditions, containing the right amount of drug and so forth. Secondly, one sees that it is stable both physically and chemically, and third that they be stored in containers which are appropriate. If you're dealing with something hygroscopic or unstable then you've got to have low humidity inside and containers that are good enough to keep it that way. You've got to deal with conditions that vary greatly, from say Darwin in North Australia where the average temperature and the highest temperature are really very, very high, so that the formulation has to be as good there as it is in the United Kingdom, or any other temperate place. So one got a fair old insight. I used to use a book in fact regularly then which was called 'Weather around the World' if you wanted to know what the extremes of temperature were. Of course, you don't have time to wait for five years to see if your product is stable. What you have to do is set up experiments at different temperatures measuring the rate of degradation of the material, and the matter of applying Arrhenius equations to reaction rates, and you made a forecast from the higher temperatures to what was likely to happen at a lower temperature. So, it's rational and it's a relatively simple application of science, and by the way I don't say that disparagingly because science is best applied simply in my opinion. There's no point in doing difficult work if you don't have to, and in fact that is one of the things I used to get upset with. I used to say that any educated fool can have a difficult idea but to have a simple idea that was practicable, now that was different, and very few people come in the second category. Most ideas are complicated and based on an unsound hypothesis, or even three or four of these laid one on top of another, which is not the way to set about applying science. In any case, as I say, going back to Glasgow, James Todd still wanted me to succeed him as head of the school of pharmacy in Glasgow and he gave me an inside track beyond any doubt with Sam Curran.

MB This was about 1961?

DJ 1960/61, that's right. Curran was the vice-chancellor there and Todd introduced me.

MB Did you think you might want that job?

DJ Well, I'm not sure that I did, but I certainly talked myself out of it by giving brutally honest answers to questions that were put to me. For example, one of the members of the selection committee said, 'Dr Jack, you've already been an academic and you've left to go into industry. If you come back to us, how do we know you won't do the same again?' I said, 'Well, you don't. If I find that I'm not performing well here, then almost certainly I'll go back into industry.' That kind of attitude obviously didn't go down too well with the academics on the selection panel but they did strangely enough with Mr C W Maplethorpe, who was the managing director of Allen and Hanbury's, a member of the Glaxo board of directors.

MB Allen and Hanbury's was a subsidiary of Glaxo?

DJ They'd been bought by Glaxo, I think, in 1957, but he had a clear vision of what had to happen in the future in pharmaceutical companies. It had to be research

based and you had to find your own drugs and they had to be speciality drugs which nobody else had. He knew that, but the only small problem was that he didn't know how. He had set up research in his company shortly after the war.

MB A man of critical vision then?

DJ Oh yes. He was a remarkable man.

MB He was president of the Pharmaceutical Society.

DJ He was a very distinguished president of the Pharmaceutical Society. He changed education policy within the society. Again, a tall, lean man and also a bit of a bully if he got away with it. In any case, he was the man who got me to go to Allen and Hanbury's.

MB He saw you at that interview?

DJ He saw me at the interview and I didn't get the job, not surprisingly, but about a month later there came through the door a letter containing a cutting from *The Times* and nothing else, which said 'Allen and Hanbury's invite applications for a Research Director' and I went along and this time I didn't talk myself out of it. So, I got the job. Now, the reason I went there, very simply, was because I had a sound background in product development but nothing in research, and I felt that as I was thirty-eight or thirty-nine then, so my first research job was at that age and by the time we'd got worthwhile projects going I was beyond forty. I was a late starter so far as the research was concerned, but the background in product development was absolutely critical for my work as research director, first of Allen and Hanbury's, then of Glaxo because it's one thing to find something with interesting biological properties, but to turn that into a medicine is another story. You see, research is very much an expression of hope. When you set up your hypothesis, however sound or unsound it might be, there's a huge element of hope or wish in it, whereas development is different. It has to be at its best a statement of intention because if the drug has the right characteristics there is no excuse whatsoever for having a long development programme. You can take a longer or shorter time to do it, but if the drug has the right characteristics it is doable and planable. On the other hand, if the drug doesn't have sufficient quality then it is essential that the research director or development director have enough courage to say, 'Sorry, it's not meeting the specifications. We stop.' Never proceed against your better judgement. Now, we all do from time to time, but not as a way of living and to go on with a drug which is inadequate… you see inadequate drugs don't get better with time, they get worse. The more you spend on them, the worse they get and the more costly they become, so it's essential that you recognise duds early and get them out of your system and put something else in instead.

MB David, you had a big career in that. I'm going to wind down at present and take a break and we'll come back and talk about that career in a moment.