

(1) Tell me about your background.

Well, I'm one of three children. My father worked with a company called Union-Castle Line, which used to run big liners down to South Africa from Portsmouth, and the mail boats. Later became British and Commonwealth, and he ended up as the head of the managerial department there. My mother was a history teacher, but also very athletic, so she was... she used to be a good sportsperson as well. In fact, my mother really was a polymath. She could write poetry, she could knit us pullovers, she could sew curtains, she could play the piano, she could play tennis, and so on. There was nothing that my mother really couldn't do. I have an elder brother, who was a scientist, and who, in fact, altered, really, a lot of my outlook on life, because he always had projects on, which were scientific, electrical, chemical, and so on. And my younger brother, also a scientist, and now a professor of theoretical chemistry down in Plymouth, really added to the, sort of, the three of us. My father was not scientific at all, and this affected our upbringing in a very particular way, in that there were always amazing explosives and things going on, which my father never quite understood what we were doing. But we used to ask him to get vast quantities of chemicals, and so on, in which he did with alacrity, on the basis that it was part of our education. So, there were very strange things that happened at home, and I suppose that... certainly my younger brother became pretty expert in constructing explosives. We built all sorts of strange electrical devices. We had, at one stage, we had one of the very first parabolic reflectors mounted on the greenhouse, which was monitoring the conversations of the neighbours, and so on. So, always there was some amazing project that was underway at home, from building things underground, or putting on plays, or whatever. My mother, being a polymath, was clearly aware of a lot of these things, but we had, essentially, a very liberal education. Having said that, we never stepped out of line, and I think as a family, you know, 'the boys' could always be relied on to behave on any public occasion. And I never remember any discipline, nor do I remember any suggestion that we would be undisciplined. So, very, very grateful to my parents for the way that we were brought up. I made the decision to become a doctor when I was about nine or ten. I remember it very clearly. I announced to my parents that that's what I wanted to do. And they were amused at this statement, not because they thought that I was academically unable to do that, but that the problem was that every time anybody mentioned the word blood, or anything like it, then I would faint. And that continued throughout my teenage years. And so I used to faint in church when there were hymns about... you know, "his dying crimson" would just knock me down, and I'd collapse between the pews, if I thought about these things. That actually carried on, interestingly, into my medical training, but I'll tell you a bit later about how I finally stopped fainting.

(2) Tell me about your schooling.

Well, I went to Chigwell School, which is a public school. I went there under the government support scheme, so my parents didn't have to pay fees, and, in

fact Peter, my younger brother, also went there; he got a Harsnet scholarship. Chigwell School was an extraordinary school to go to, and a very large number of people in my class ended up in Oxbridge, and virtually everybody ended up somewhere at university. But from my school associates, there were five or six that came up to Oxford, and perhaps a similar number to Cambridge. The... I enjoyed school, generally. I ended up as head boy, and, interestingly, being head boy of a public school, I think it was... you had more power, then, than I've ever had before, or since, in terms of absolute authority. It taught me some things about authority, and I made some mistakes, early on, as head boy, in that regard, being rather over draconian. And as time went on, realised, actually, what you needed to do, in terms of leadership, was not to be draconian, but to actually use power in a careful way. And interesting, I think, that that resonated much through my life. I ended up in positions where I did have authority, but I recognised, actually, the ways in which one might use that. And again, when we deal with OCDEM later on, I think a lot of what I learnt as head boy at Chigwell, and the lessons that I learnt there, were important. But in retrospect, I certainly made some mistakes, in terms of the way that authority could be wielded. Of course, things have changed a lot, now, at Chigwell, and I'm sure that the head boy, or, indeed, girl now, would not have the sort of authority that we had then. But in those days, basically, the prefects ran the school, and the teachers taught, but we had jurisdiction up to, and including, corporal punishment.

I came from Chigwell to Corpus Christi College, and the... it was a delightful college to come to. It was quite small. There were only forty-eight people who came to the college, at the time that I came, and only three of us were medics. So, there was myself, somebody by the name of Donald Moir, who later became a consultant at Milton Keynes, and was an outstandingly good clinical haematologist, well liked and known. And my other associate, Philip Home, who, in fact, is well known in the diabetes sphere, and is Professor of Diabetes in Newcastle. And those were my only two associates. Of course, the great thing about the Oxford education was that clearly you couldn't hang around with just two people, all the time. So, you had to talk and mix in with other people, and that was part of the education of Oxford. And it was, indeed, imposed at meal times, that you weren't allowed to talk about your own subject. So, you could get 'sconced', which is a silly habit of being forced to drink too much beer, and since I was teetotal anyway, I did try and avoid such things. But sconcing was still in place when I was up at Corpus between '66 and '69. And I'd recently, actually, talked to the steward, who said "oh, sconcing had stopped in the mid fifties", but it hadn't. It was still around, and I remember sconcing at the time that I was an undergraduate, in those years. Corpus was a wonderful place to be. We had individual tutorials, so that there was no place to hide, in terms of medicine, and I became the Junior Common Room President, which I much enjoyed. And there were various dramatic presentations. I remember being in a performance of 'The Bees', which was written by one of the dons, which was a take-off of a Greek tragedy, written in terms of Corpus Christi College's... one of the centenaries. And this is just a brilliant play/musical that we were in.

It was part-produced by someone called Mark Davies, who I rather liked. And Mark, I bumped into - he was a year, or maybe even two years ahead of me. I just think a year ahead of me, actually - reading Greats. He was someone who seemed to be able to write Greek poetry in his sleep, and was feared, almost, by people at Corpus as being such an outstandingly good academic that you had to be very careful with Mark. He, it transpired, had started to learn Classical Greek when he was about five or six, because some old ladies, who'd been looking after him in nursery school, realised that they'd run out of things to tell him, so they thought "well, why don't we teach him Greek?". The reason that I know about Mark is that I liked him a lot, and when his sister came up to Somerville, I thought that I'd better go round and see her. And I fell in love with her, and she became my wife, and is still my wife, and so Mark is my brother-in-law. Well, those were the Corpus days, and they ended up successfully.

I got a good 2:1 degree, to the extent that I could then go on and do a DPhil with Roy Kay, who'd been one of my tutors, whose tutorials I'd thoroughly enjoyed. He was based at Keble. And he hadn't had a previous DPhil student, for the simple reason that all the people he taught were physiologists, but he wasn't a physiologist, he was a physicist. And when I came to work with him, I suddenly realised that, actually, what you needed to do good physiology research were other disciplines, including both physics and mathematics. I had a great time with Roy Kay. He was quite excitable, I think is a fair term to describe him, so that occasions you would need to, sort of, duck. But, he was a really wonderful scientist, and we did some very interesting work, there, relating to what amounts to the technicalities of human hearing. Technically, it was called auditory psychophysics, but essentially, what it was, was looking at the way in which the human brain deciphers speech. And it deciphers speech, not on the basis of any very straightforward system of tonal hearing - in other words, what you think that the hearing would be, which is to hear a piano play going up a scale. It's very little to do with that, because, if you think about it, it doesn't matter whether someone's voice is low or high, you're still deciphering it. How are you doing that? And the answer is, you're looking at what amounts to frequency modulation, which is the way that the frequency within your voice changes up and down. Essentially it's the [whistling up and down] in your voice, as opposed to the [whistling on one note, louder and softer], which is amplitude modulation; that is getting louder and softer. It turns out that your brain has got quite specific channels. It divides all the sound up into channels, which are selective for these frequencies. And, interestingly, in mathematical terms, it turns out that the way to sort this out is to use things called Fourier Transforms. And Fourier was a mathematician, who discovered how to analyse complex sounds. And again, that reflected forward in things that I did later in life, of understanding how you might use physics, and, indeed, mathematical techniques, in order to get answers to complex biological problems.

- (3) And can you talk, briefly - just back-tracking - about the content of your medical education, as an undergraduate?

Yes, the medical education consisted of lectures, of tutorials, and a considerable number of classes. The tutorials were one-to-one, so you had one anatomy tutorial a week, and one physiology tutorial a week, for eight weeks. And, for those, you needed to write essays, and they were an hour long, so you needed to be able to talk sensibly about the subject of the week, for an hour, in the presence of a tutor. So, there's a fair amount of pressure to get the work done. You couldn't turn up and pretend to be at the back of a class, if there's only one of you. The lectures were voluntary, in terms of whether you attended or not. In other words, there was no question of logging in or not. But most of them were good, and I think most of the medical school were turning up pretty assiduously to those. You needed to turn up to the classes, because they were ticked off; you had to do so much, in terms of your biochemistry, and in terms of the physiological experiments. And they were pretty well arranged, and there was a programme of those things. And I found all that extremely enjoyable. It was... I was always good at that stuff, having, as I said, grown up with an elder brother, where bits of equipment, electricity, and so on, were always around, and we were always building things. And so, I found all of that both interesting and very straightforward, from my point of view. The anatomy was proper morbid anatomy. We had a body, and I know the name of the person who gave their body, to this day, but, for obvious reasons of discretion, I won't say the name, but it was tattooed on to his chest. And we pulled him apart, progressively, under the direction of the anatomy demonstrators. We actually didn't learn a huge amount of anatomy from doing that, and I don't think many people did. It's not a very good way of learning anatomy. It teaches you about one cadaver, but, actually, because your dissection skills are poor, and the cadaver is preserved in formaldehyde, the amount of anatomy that you can learn... you can learn the big stuff, but the small stuff you can't. I remember, on one occasion, we tried to look at what the lymphatic system looked like, and we decided to inject some India ink into the lymphatics. This is a useless thing to do, and basically it squirted all over us, and got nowhere near the lymphatics of the cadaver. We used to have four medical students to the cadaver, and those medical students were Philip Home, myself and Donald Moir, who I've already mentioned, and one other person called John Nash, who I still know, and we're very friendly. And he went off and became a Reader in Histology in Liverpool, and so he had a very successful academic career, himself, relating to anatomy. We eventually sort of used to use the anatomy sessions as a rather useful philosophical meeting place, rather like one would sort of sit over coffee. And we used to lean on this cadaver, so that, by the end of the year, there were elbow dents in his thorax, where we would lean, as we were debating all sorts of philosophical things, not doing a huge amount of anatomy. And, in fact, the anatomy that we learnt, we did really learn from the books, so much so that, actually, when Donald Moir came to be examined, on one occasion, they'd laid out the phrenic nerve and asked him to identify what this was. And Donald, despite being an extremely good academic, had got not the slightest idea of what this was. And so there was a long silence, apparently. And, eventually, one of the demonstrators said "have you ever heard of the phrenic nerve?", at which point Donald, who'd

got a visual/auditory memory, recited the whole of the morbid anatomy of the phrenic nerve - as to where it arose, what it came past, and so on - in the most amazing way, to the astonishment of the examiners, because he'd simply learnt his anatomy in that particular way. I suppose, rather like the way that we were taught French at school, which was a load of academic French on the page, that no one could actually speak French at school, but we seemed to be able to do exercises, to be able to spell it. The... We then had finals, in the usual way, so we'd got... After five terms we did our BM and BCh - that's first BM BCh; that was the medical part of the course. And then, for the last four terms, we'd done a BA in Physiology. So, you ended up with BM BCh and a BA in Physiology, after the three years. And then you needed to go on and do a thing called "Bugs and Drugs", which was major pathology. And I did the... but I had moved off, from the end of my BA, to do my DPhil, and so I did my... I did the Bugs and Drugs separately.

Can you remember if you learnt anything about diabetes, when you were an undergraduate?

No, I don't remember that, specifically. But, actually, the course was pretty wide, and I certainly remember learning all of the... yes, I learnt all of the Krebs Cycle, and all of that metabolism, so it must, of course. But I think not really medically-related, at that stage. One of the criticisms of the course was it's rather theoretical. And so, I suppose, rather than know a lot about what someone with diabetes would look like, I learnt all the metabolism of how ketone bodies were formed, and how oxaloacetate, and part of the citric acid cycle, worked, and how you produced ATP, and so on. All of that fundamental biochemistry we learnt in some detail, and could reproduce. There was a time when I could draw out every single part of the Krebs Cycle, including all the formulae for the part of that, and a thing called the Embden-Meyerhof pathway. So, yes, essentially, I did learn all that stuff, but I don't think we thought much about the practical aspects, at that stage, and it wasn't particularly encouraged or integrated. And similarly with, say, acidosis, which you get with ketone formation, which is the real, you know, dangerous part of diabetes, when it's newly diagnosed. Again, we learnt all the stuff about acid-base balance, and the Henderson-Hasselbalch equations, and so on, which, again, we were taught, but I'm not sure we ever saw anyone in acidosis - I'm sure we didn't - or even a photograph of that. So, the physiology was slightly dissociated, and probably one of the disadvantages of learning that sort of physiology. I learnt a lot of neurology, as well, and because of then going on to do a DPhil in auditory psychophysics, I was really on the path to become a neurologist.

(4) Tell me about what you did after your thesis, after your DPhil.

Well, I'd got a place at one of the London teaching hospitals: St Mary's. And I'd put that off when I got a place at Corpus, and then I'd put it off again when I was doing a DPhil. And then I was going to go to them, finally, but then I put it off permanently, to their huge annoyance, because I decided to do my clinical medicine in Oxford, which I could do. And the reason for doing that was not

just relating to DPhil, but was related to the fact that, in 1970, I got married to Clare. And she was still an undergraduate, at the time, so while I was doing my DPhil, she was working for finals. I'm glad to say that she not only got a First, but got a Congratulatory First. So, clearly married life didn't affect her too badly, though maybe she'd have even got a better Congratulatory First if she hadn't married, but anyway. We were then living in a sort of dungeon in St Bernard's Road, while I was starting my clinical attachment. And that was mainly at the Radcliffe Infirmary, and St Bernard's Road is really just a hundred yards around the corner, so brilliant place to live. I suppose, parenthetically, I should just say that it was the basement. It was very damp, and I was quite keen that Clare's parents shouldn't see it, until I'd painted it and dried it out, which I did successfully. And so, we had a very interesting time there. It was run - I'm sorry, this is rather parenthetic - but it was run by a lady who said that she just kept this place for her pin money. And she was very posh, and came from Wargrave. And we said "well..." The furniture was in such a bad state, in this flat that was in the basement, and was all damp, that we thought that it was unreasonable as furniture. But we reassured her that we didn't need her to buy any new furniture. We just said that we would gradually replace this with our own furniture, so that when we left, it would be essentially unfurnished, and that her furniture we would have disposed of, which she agreed to, with some sort of alacrity, actually. Just said "oh yes, yes, that's perfectly all right". And, in fact, we actually, literally, burnt her furniture on the fire, there. It had an open coal fire, which was brilliant, because it ventilated the place, and we could heat the whole place up using coal. And we used to use her furniture, progressively, as firelighters. So, we did burn all the furniture, but not outside, but inside in the flat.

I really enjoyed my time as a medical student. It was entertaining, it was fascinating. I was always a keen medical student. I would turn up on firms, and so on. I was occasionally shouted at, from consultants, who said "where's everybody else?", and used to feel like saying "look, don't shout at me. We're here!". In fact, I'm sure we did, on occasions, because we were fairly forward people, all having Oxford degrees or Cambridge degrees. So, we would just say "don't shout at us, we're here. Just shout at them when you find them". Not everyone turned up on the firms. The reason that people didn't turn up on the firms was related not to laziness, but actually to the opposite, which is that we were the first group of people to try and get through, in three years, the clinical medicine, which they had decided that they would give us a continuous assessment. Now, Oxford had never done continuous assessment before, so their idea of continuous assessment turned out to be that they were going to set us a lot of little exams, instead of one big exam. That was all right. But then, of course, lots of little exams in Oxford, it turns out to be that they were going to set these in Schools, in the proper way that Oxford exams are set, and that we'd all turn up in subfusc, in the usual way, with white bow-ties and rosettes, and so on, and that we'd sit down and do the exam. Well, these were happening every term, which is every eight weeks. But, of course, we had all come out of

the situation of finals, and everything else, where, in the final term, people say “you do realise, don’t you, that it’s finals in eight weeks’ time? We need to hit the library and hit the books”. And so, after about a week on the first firm, someone pointed out that it was only six weeks away before we’d got an exam in Schools, and we’d better not muck around on the wards, wasting our time chatting to old ladies, or whatever. We’d better hit the books, because we were just going to have an exam. And, sure enough, we did have an exam. And they said “write short notes on peptic ulcer”, or whatever. And, of course, people had learnt everything that there was to possibly be known about peptic ulcers, so that, you know, in that exam, people wrote reams and reams and reams of stuff; you know, put their hand up “more paper, please, more paper”, because we’d all come out of Oxford final culture. Well, this went down badly with all the medics on the firms. Not only had we not been turning up enough on the wards, but they had to mark these wretched things. And so, suddenly, with this continuous assessment, they’d got a pile of paper from Schools, which was a mile high. Well, the next time round, they thought “well, we’ll fix this”, so they said “write short notes on...”, and then they said “in not more than half a page”. Well, we’d still turned up in subfusc, and we’d still gone through the same process of people saying “well”, you know, “it’s another exam down in Schools”, subfusc, white bow-tie, you know, get your head around the books. And so, we’d still known a million things about cardiomyopathy, or whatever it is that they would ask us. And so “write short notes on cardiomyopathy”. And this time, because you’d only got half a page, and people had to be within half a page, people wrote in the tiniest writing, the absolutely micrographic writing. And so, everybody’s short notes... so instead of having pages and pages of it, they still had a smaller pile of marking, but this time they had to use magnifying glasses in order to see what people had written. This sort of farce continued progressively, and we were still wearing subfusc in order to do our clinical examinations. The first... on one of these occasions, one of our fellows turned up just in his normal, you know, everyday attire. And we said “what are you doing?”, you know, “this is one of the continuous assessment things. You have to turn up in subfusc, you have to turn up in a gown and white bow-tie” - I mean, a ludicrous thing for a clinical examination, but anyway, we were turning up. And he said “oh my goodness me, I haven’t got a white bow-tie”. And so, he got a corn-flakes packet, and cut out the shape of a bow, and put this round his neck on a piece of string. But, of course, the white bow-tie... the inside of a corn-flakes packet does not look white, by any stretch of anyone’s imagination. And it’s got these sort of grease stain marks on it. Anyway, there were lots and lots of farcical things that went on at... in medical school. There was ‘Tingewick’. I was always interested in theatre, and, indeed, in my late teenage years, and, actually, throughout the rest of my life, I’ve done quite a lot of production. And so I was enthusiastic about Tingewick, which was the theatrical production that the medical students did every year. And I took off - and I’d written the song for and took off - one of the neurologists, as it happened, and a slightly unfortunate target, because I later worked with him and found him a charming man. But I remember taking him off on stage. And part of my routine was to actually be sufficiently unaware

of my surroundings to fall off the stage, which I did every night for some days, during that.

(5) Did you learn anything about diabetes as a medical student?

Yes, we did see a very large amount of clinical medicine, as medical students. And one of the advantages of the Oxford medical school, it was really quite small, and so there was plenty of clinical material on the wards, and we were always encouraged to see the acute cases. Not, at that stage, that I'd got a particular interest in diabetes, but I remember we really had learnt a very large amount of medicine, during those years. And when I became a houseman, when I'd qualified in 1975, I think I was like most people who had come out of Oxford medical school, of really knowing medicine. One of the... I remember thinking, as a houseman, you know, that I knew everything I needed to know, in order to manage people safely, and I think that was true. I'm not suggesting I needed... I knew everything that there was to know; I knew everything that I needed to know to be absolutely safe. And, interestingly, one of the things you need to know is what you don't know. In other words, you don't start making things up if you don't know it, but you know the limits of what you do know, and you can fix things, and you refer up. So, I think that the Oxford medical education, then, was really good. I thoroughly enjoyed it, and it shoved a very large amount of medicine inside my head, and a lot of that I have not forgotten. So, I've got nothing but praise for what was... what happened then.

I suppose that there's something I should mention about Oxford, which is important, which is that if you are surrounded by intelligent people, your learning is both faster and more entertaining. And that was true at Corpus, and I remember the environment in Corpus was different from Chigwell. Chigwell - sorry to reflect back on that - but just to say, in educational terms, Chigwell, you had to do well, because there were people around... there was huge competition at Chigwell. We started off with fortnightly orders, where we were put in the order in the class in which we had managed in the last two weeks. And then we went to monthly orders, so there's always this competition going on. But the thing about Chigwell, throughout the whole of the school, was that you had to do well, but never had to be seen to be doing any work. So, that was the thing. And so... and you get very used to this, which is "oh no, not doing any work", and you knew that everyone was absolutely sweating away at home, or in prep, doing this. Coming up to Corpus, you suddenly realise that people are quite willing to say "thanks very much for coffee after dinner" - I used to give out a lot of coffee in Corpus - but people then used to say, after half an hour of coffee after evening meal, would say "thanks very much, David, that's great. I need to go off and do some work". Now, of course, at school, you'd never have said "I need to go off and do some work", but people at Corpus did that. And the atmosphere in Corpus was that of work. And similarly it was in medical school, that people would take it seriously. "Look, guys, we need to learn this stuff", you know. And there was a real pressure that, you know, you're an idiot if you couldn't interpret an ECG, for goodness sake. I mean, you



know, you were taught about an ECG, and you were taught once or twice, but after that, you were looked at completely askance, if you couldn't interpret an ECG. And this used to go on all the time. So, there's lots of pressure from your peers to say "come on", you know, "we've done that", and "don't delay us on the ward round", or whatever, "by faffing around, and mumbling about stuff that we've already taught". So, people did learn a very large amount of medicine. The other thing was that there was an interaction, in medical school, with the people who were lecturing. So, it wasn't a question that you could stand up and lecture badly, all the time. There were two things that would happen. One is that people wouldn't turn up to your lecture next week, and that was true as an undergraduate, as well as with graduates. But I remember, on one occasion, someone coming and talking to us about the liver; I remember it quite clearly. There were a group of about twenty or twenty five of us who'd turned up, and it was billed as, you know, lecture about the liver. And this lady had started off with some theoretical stuff about the liver, and so on, and was giving the most tedious lecture that I think I've experienced. And then, after about ten minutes of this, one of my colleagues said, in a very loud voice, "look, you must stop"! You know, this was really surprising, but again, because people had attitude. And he said "you must stop". He said "we're medical students, and we don't want to hear about any of this highfalutin stuff". He said "just tell us what you know about the liver. Just throw all your notes away, and we would like to know what you, as a hepatologist, know about the liver and how it works", you know. And this lady at the front, she was... she must have been very young. I mean, she must have been one of those sort of, you know, young scientists doing a DPhil, or whatever. And you could see the startlement in her eyes, where her lecture was just going to be completely thrown aside. And I remember her suddenly thinking... saying, sort of, "oh, all right", and then starting to write on the board, and giving a really brilliant lecture, with no notes. Just saying "look guys, this is roughly how the liver works, and, you know, this is what goes in, and this is what comes out, and this is how it detoxifies, and all the rest of it". Just a brilliant lecture. But again, a brilliant lecture because of the feedback from my associates. And so many of my associates have become eminent in the field. So, I think that, again, sitting around... the privilege of sitting around with really clever people has been a privilege that has gone on throughout the whole of my life. It is a huge privilege, it's a great challenge. But that sort of attitude of "oh, for goodness sake, don't start asking me stupid questions, because we've been through this", and so on, is brilliant. It does stop you getting into a sort of tedious recycling of stuff that you shouldn't be re-discussing.

(6) Talk about what you did after you qualified.

I started off as a houseman - again, a huge privilege - on the Nuffield Department of Medicine. So, this was the top medical house job, essentially, in Oxford. And I worked with a guy called Tony Windebank, who later became a very important consultant in the Mayo Clinic, and George Hart, who became a cardiology professor, and, again, was well-known. The Nuffield Department of Medicine was then run by Professor David Weatherall, who'd just arrived from Liverpool, and

the Reader in Medicine, at the time, was a man called Robert Turner. Working with David Weatherall was a huge privilege, and he was a very good clinician, as well as being an exceptionally good scientist. I would come on quite early, on to the wards, and, periodically, I'd find David Weatherall would have been on the wards ahead of me, worrying about one or two of the patients that he wasn't quite sure about. And he was a very good diagnostic clinician, but he wouldn't waste time on the wards. So, if everything was running smoothly, he would go round and say "thanks very much, I just seem to have rubber stamped everything. That's the way it should be", and he'd disappear again. So, very, very efficient use of time, and never would muck around spending time on things which were straightforward. Would spend a lot of his powerful mental energies on things which were problematic. Tremendous clinician to work for. The very first patient, actually, who I think I'd presented to David Weatherall - I gave a brief little synopsis - and then this patient piped up, and pointed to me, and said "doesn't he look pale?". And David Weatherall said "don't worry about that, he always looks like that". But it was one of those sort of absurd occasions, that I remember, of just having the whole of my careful professionalism sort of undermined by a patient, who'd just sort of pointed to me and said... you know, that I looked pale was nothing to do with him. Robert Turner was the other clinician who was around, at the time, who I remember. A very, very good clinician and enthusiast. Someone who was very much not pompous, was very much someone who came in, did the work, and got out again. I very much liked Robert Turner, and more of him later.

After doing the house jobs on the Nuffield Department of Medicine, I moved off to Swindon to do my surgical house jobs. I would say that with the house jobs, they were very hard work, in terms of long hours. We would sometimes be on for a weekend. If you were on for a weekend, I would come on - on the Nuffield Department of Medicine, for instance - on Friday morning, and I would get off on Monday evening, 'cause I'd be on over the weekend. And now... Of course, you could get some sleep, during that time, but you were on continuously, all that time, for the patients under your care. And I think we've lost a huge amount by not doing that. The reality is that I wasn't up all weekend. Indeed, during the weekend, you'd get things under control in the mornings, you were looking after the patients over the weekend, and they were medical patients, so you should be able to cope reasonably well with a sensible number of patients. You were coping with four wards of patients, perhaps, or sometimes just two, which would be two times thirty, maybe sixty patients or something, of whom most would be stable. And you could easily manage that, as a houseman, especially since you'd got senior housemen and registrars on the end of a phone. You were responsible for those people, and you got to know them. The reality is that you went round and saw them every single day. They knew who you were, you knew who they were. If they complained of a pain, in the middle of the night, you knew the sort of person that they were, and whether this was likely to mean you needed to get out of bed or not. And my view about it is that that way of learning medicine is just a... is a very good way of doing it. You have to know patients, and you

have to follow them through. Today's way of just saying you must be on for eight hours, and then you've got to have so much rest, and all the rest of it, is a ridiculous way of doing medicine. It breaks up people's lives in a crazy way. It means that every weekend you're on for a little bit, and so you never have a weekend off. But secondly, you never get to grips with who these patients are, you never get to see the results of what it is that you do. In an eight hour shift, all you do is you make sure that no one dies, and that you've just about, sort of, done the stuff, and got some fluids up, and then you rush off again. And the next person does exactly the same, so that patients are completely bewildered by a whole stream of different doctors, none of whom properly know their case. And this is crazy. The European Working Time Directive just should be ignored for purposes of medicine. And it's something that I haven't spoken about loudly enough, but I have very, very strong views that this is very bad medicine, both socially, because it never gives people weekends off, and it's very bad for training. That aside, I went off down to Swindon, did my house jobs in Swindon. Worked with Mr Huddy, down there; an exceptionally good surgeon. And I learnt a lot from him, and how you should run a surgical firm. I saw some crazy things going on down there, as well, and I was also down there with Tony Windebank doing house surgery. Oh, that was the time, incidentally, that there was a strike - it was the only time that there was a strike of doctors. And Tony Windebank and I were both people who felt that we certainly were not prepared to strike, and certainly wouldn't strike, and that it was quite against our culture to do so. And I do remember, very strongly, that we were - it didn't make any difference of course to the totality of anything, the fact that we carried on - but we were subjected to really outstanding amount of abuse. And so, I'm very sympathetic with the sort of poor people who get labelled as scabs, as indeed we did, by people who seem to suddenly turn into fanatics about this, and not recognise that people might have moral revulsions about taking industrial action, as a doctor.

What year was this strike?

So, this must have been '75, '76, some time about then. I qualified in '75, but actually, just before I qualified, I'd gone out to India with Clare and with my elder brother, who, I've mentioned before, was an electrical engineer. And we worked for three months in Sarenga, which was a Methodist missionary hospital, around hundred miles west of Calcutta. Very interesting and exciting time. My elder brother, while he was out there, mended their telephone system, which had been installed but never worked. And the first thing that he pointed out, as a reason that it didn't work, is that there was no wire connecting any of the phones together. But that was a fairly straightforward start to his diagnosis as to why the phone system didn't work. It was that there were no wires.

I came... after my house surgery jobs, I did some infectious diseases, and then I did a year of neurology, working with Peter (in fact, Brian) Matthews, who was the professor then - no relation of mine, at all - and John Spalding, who I'd taken off in Tingewick. John Spalding, who I much admired as a neurologist; a

wonderfully quiet spoken man, with a huge moral conscience, and an amazing diagnostic clinician. Absolute privilege to work with him, and, indeed, with Peter Matthews. Peter Matthews was a very good academic, wrote some very interesting and brilliant things in neurology, and had a very dry sense of humour, and we had some tremendous times doing neurology.

I moved from there off to Central Middlesex, as registrar. And Central Middlesex Hospital was then running in very much the traditional way, where the registrars and senior registrars ran the hospital, rather in the way that I've described at Chigwell. The prefects used to run the school, and the teachers just had to get on teaching. At the Central Middlesex, the consultants would just come in and consult on the rounds, and then rather disappear. And again, the camaraderie at the Central Middlesex, between the registrars and senior registrars, and how the whole system worked, was brilliant, so that if you ever came into Central Middlesex, as a patient, you were getting, in my view, some of the best treatment that there was available in the world, in terms of depth of consultation, and so on, because all of the medical staff - the registrars and senior registrars and senior house officers - would meet for lunch every day. And we would exchange stories about who was on the ward, and who we needed other people to see. So that if you've got someone with bellyache, you'd talk to your surgical colleagues, over lunch, and say "can you just pop round and have a look at Mrs Jones?". And then the surgeons would say, you know, "oh, Mrs Smith seems a bit short of breath, and we're not sure whether she's got asthma". I mean, on one of those occasions, I remember someone describing to me, over lunch, saying someone has got asthma, and would we pop round. And we said "well, what does it look like?", and so on, and we thought "well, I don't know, that's not asthma, that's something different". And we went round and found someone in acute renal failure, on the surgical ward. Now, that's not the surgeon's fault, that someone's in acute renal failure. But the reality is, at the Central Middlesex, people always used to gossip about what was going on with their patients. And so people would be shifted, not by some consultants, between the cardiac care unit and the Intensive... the ITU, the Intensive Therapy Unit. They would be shifted around by the middle staff, and they would make sure that there were spaces on ITU, and so on. Indeed, we managed it so well, that some of the consultants, who were slightly dangerous, would find that they had very few patients under their care, at any one stage, 'cause they'd always be triaged off to cardiac care unit or to ITU, or shifted off because they belonged to someone else, or they'd got some other more important thing. So that even the consultants found that some of them had a quite high work-load, because they were competent, and some of the incompetent consultants would find that, on their ward round, they'd only got three or four trivial patients to look at, and very few decisions that they could make. So, Central Middlesex was a good way of learning things. I did quite a lot of teaching for Membership, at that stage, and enjoyed teaching, and did a lot of clinical teaching.

While I was at Central Middlesex, I had a series of letters from Robert Turner, who I mentioned before. Now, Robert Turner, I had bumped into when I was

walking down the corridor, a couple of years after I finished working with him. And he bumped into me in the corridor of the Infirmary, and said “what are you doing now?”. And I said “I’m looking round for a registrar job” - which I eventually got at the Central Middlesex - but he said “well, what do you think about research?”. And I said “well, I’ve done my research”, you know, “I’ve got a DPhil in psychophysics”. But then, I suddenly realised that, actually, I hadn’t got a job, and that he wasn’t asking me in general terms what I thought about research. He was asking me, I think - I know - whether I wanted to work with him for a few months, before I went off to Central Middlesex. And so, in fact, I had done that. And I brought my view about non-steady state mathematics with, as I mentioned, about frequency modulation and amplitude modulation, to look at the endocrine system. And we started to look at some data, then, about the non-steady state nature of insulin and glucose feedback, and started to apply Fourier Transforms and autocorrelation, and a whole load of those mathematical tools, to the data, which started to fall out in a series of fairly straightforward and interesting papers. And Robert was then so taken with what we could do with all of this, that he wrote me a series of letters saying “please come back to work with me in Oxford”. So that, instead of then moving from Central Middlesex registrar job to a neurology register/senior registrar job, I got sucked back to Robert Turner’s laboratory in Oxford, and started - or rather continued, then - my diabetes research, which I’ve been in ever since. So, it was one of those chance meetings, in a corridor, that just moved me from being, as it were, a budding neurologist, to a diabetologist.

(7) Talk about your years with Robert Turner.

So, my years with Robert Turner really date from 1979, 1980, down to the time in 1992, when I became consultant physician, and took over the clinical services in Oxford. So, really just over a decade. Robert Turner was a brilliant person to work with. He’d fished me back from Central Middlesex, because I’d done three months of research with him. He’d written to me, again and again, about coming back, and finding me some funding, and so on, to do research. I wasn’t trying to do a DPhil; I was just a post-doc. And we did a very large amount of work on the control of insulin secretion, and a large amount of work on insulin resistance. We looked at pulsatile insulin delivery, using all of the mathematical tools that I’d picked up during my time working with Roy Kay. And, over that time, I’d picked up a Junior Research Fellowship at Balliol, and then a Senior Research Fellowship – the Joan and Richard Doll Senior Research Fellowship – at Green College, and I was the first person to hold that post. The JRF in Balliol was one of those things that I’d applied for, and they’d just said “come down and meet us over lunch, as a sort of preliminary”. And I’d wandered down to Balliol to have lunch with the people there, in 1982. And I’d talked to these people, casually, over lunch, and then they just said “oh, just pop over here to... now”. And they led me into a room, where there were, I think, fully, fifteen to twenty fellows, all in a semi-circle, with a chair in the middle for me to sit in, and suddenly realised that they were going to grill me. I hadn’t prepared for any of this. I remember, to this day, the square-wave change in my adrenalin, as

I suddenly realised that they were just going to grill me. Anyway, I must have done reasonably well; they appointed me as JRF. And it was an honour, too, to be made Senior Research Fellow at Green College. Colleges were very different, in their ethos. Balliol was full of very political and important people, and always interesting to dine there, or to have lunch there. And Green College was... didn't have that breadth of membership - tended to have just medics - so, from that point of view, was less eclectic than Balliol. The work on pulsatile insulin delivery went very well. We did a lot of mathematical modelling, of which, I think, the homeostatic model was part, and that was published in 1985. That was... A large amount of background work went into producing that model, and, in fact, it's the most widely quoted mathematical model in diabetes, to date, and has got huge numbers of citations - I think, currently, about eight or nine thousand citations - in the literature, to the model from that particular paper.

Now, let me just tell you about Robert Turner, because there aren't many people who work for someone for a decade as a post-doc. Robert Turner was an amazing clinician and physiologist, and was interested in mathematics, and genetics, and clinical care, and devices, and so on. Interestingly, he was very poorly recognised as being a shining light, in Oxford, until much later in his life; in fact, nearly too late. And it was years and years before Oxford got round to giving him a personal chair, which was a continuing disgrace, considering that he'd taken over, effectively, the department of the Regius Professor of Medicine. Because, at the time that Sir Richard Doll took over as Regius Professor, Richard Doll didn't need anything except an office and mathematicians around him; he was that sort of epidemiologist. And there was a very active laboratory that Robert took over, and did large amounts of insulin assays, and so on - Robert having trained both in Cambridge and in Boston. Robert was a delight to work for; always enthusiastic, always interested in what was going on, not prone to silly outbursts, very even-tempered, charming in many respects. Infuriating in some, in that if he wasn't very interested in what you had to say, then a sort of portcullis would come down over his eyes, and so he actually, almost literally, wouldn't be listening to what you were saying. I think you could have just said "rhubarb, rhubarb, rhubarb", and Robert wouldn't have noticed, so that there were times where you just thought, well, I might just as well stop talking, and, indeed, you did stop talking, because Robert wasn't listening. And there were the extent to which Robert wouldn't change his mind, so he was pretty stubborn about things. And that stubbornness was the major force behind the success of the UKPDS, because people kept telling him that there was no more money, and he would then just ignore that, and just get money from other places. I mean, the British Diabetes Association, it was then, repeatedly said that he couldn't have any more research money. And so, Robert used to just say "well, that's their opinion, but I'll write to the trustees". And he used to just circumvent the research committee, and say "this is so important that you need to pay", and they did, to the fury, of course, of people who were running the research committee, to say "what's the point of a research committee if we say there

shouldn't be any more money?". But Robert used to do all of those things, and get money, squeeze money, out of all sorts of people, to keep all of that going. A great enthusiast. Managed, in his time, to be, really, the trainer of a huge number of people who ended up in key posts around the country, and in other places. So, Professor Steve O'Rahilly, for instance, came through the laboratory, and Professor Andrew Hattersley was there. Jonathan Levy, who was my clinical colleague in OCDEM, worked with Robert, and, of course, Professor Rury Holman, who not only was key to the UKPDS, but went on to found, what is now, the biggest clinical trials unit in diabetes in the world, running out of OCDEM. And all trained through Robert. Added to that, there was Tim Davis, who was a contemporary of mine, now Professor at Fremantle, in Australia, and a large number of other academics who've ended up in various positions round the world, and who are still luminaries there. So, Robert really managed to have a sort of engine of, not only training people, but actually finding and identifying the sort of people who would work with him. Very exciting to work alongside all of those people, and very entertaining too.

Within those years, lots of extraordinary things happened. I suppose some incidents are worth recording. We did start off being more amateur, in research, than one would be these days, in terms of standard operating procedures. So, research was easier to get under way. These days, it's absolutely strewn around with so much bureaucracy that it's extremely difficult to do clinical research, now; very difficult to fund, and very difficult to get off the ground. But it was easier, in those days, though, of course, everything went through ethics committees. But there was one occasion when we managed to - by making a mistake over refrigeration of some preparation - to give an infusion of the bacteria *E. coli* to a medical student, who then had a rigor in the middle of the night. So, that was a thing that we shouldn't have done. Luckily, we filled him up with antibiotics, and he was all right. People used to faint, sometimes, with research, and I did say, earlier, that I used to faint, and so I was sympathetic to that. The reason that I eventually stopped fainting, if I can just reflect back in to that, as a... during an anatomy session, was that on one occasion, in anatomy, the group of all four of us were taken aside from leaning on the cadaver, that I mentioned, and taken over to a skeleton. And the demonstrator was trying to teach us about the structure of the skeleton. And I came over, in my usual peculiar way, of thinking "oh my goodness me, this is a skeleton", and started to faint. Philip Home... I said "I'm going to faint". Philip Home said "in that case, I'll take this scalpel out of your hand", did so, and I collapsed on the ground. And the demonstrator carried on talking, as though I hadn't collapsed at all, 'cause you come to fairly quickly, if you faint and collapse on the ground. And so, I'd come to, and the demonstrator had completely ignored me, on the ground, and was just saying, you know, "the clavicle joins up here", and so on. And I'd sort of... I'd thought "well, I'd just better get to my feet, again". So, I'd got half way up, and, of course, if you faint, you mustn't get up too quickly, and so I fainted again, as I got up. And the demonstrator, again, didn't do anything about this, other than put his foot on my chest. And so, he was standing, talking to the

other medical students, with his foot on my chest, to keep me on the ground, while he was continuing to say “and the clavicle joins the sternum here”, and so on. And I remember just thinking “this is the best treatment I’ve ever had for fainting”, you know, that no-one’s panicking around, and all the rest of it. It’s just that I’ve fainted, and I need to lie down flat, and this guy knows this. And what’s more, he’s not even taking the slightest notice of the fact that I’ve fainted, he’s just carrying on with the demonstration. I never fainted in my life, after that. It taught me that, actually, this is just crazy. But I can remember, to this day, this guy’s foot pushing down on my chest, so that there was no question that I could get up for a bit. People used to faint in research, all sorts of pandemonium broke out. There was lots of politics. People did silly things with gamma counters, and so on.

Robert was such an enthusiast for doing insulin assays that you needed insulin-free plasma for this. Insulin-free plasma was, obviously, you know, the standard against which you check whether insulin’s available in other people. So, the way you do that is, you just get some plasma from normal people; that’s just get some blood, spin the red cells out, take what’s left on the top. You put in activated charcoal - that really strips out all the insulin there is - spin it all down, and then you’ve got your insulin-free plasma. Melanie Burnett, who was one of the MLSOs - the Medical Scientific Officers - on one occasion, came up to me and said “look at this blood. What do you think of this?”. And she’d got a test-tube of blood, which had been spun down, and the ratio of the red cells to the plasma on the top was all wrong. There were just so... there were few red cells, and a very large amount of plasma. And I said “well, where’s that from, become this person’s clearly very anaemic?”, and she said “well, it’s from Robert”. And so, I said “what do you mean?”, and she said “well”, you know, “taken this blood from Robert for insulin-free plasma, and I’ve take fifty mls”, and all the rest of it. So, we then went round, and found that all sorts of people in the lab, that Robert was keep on giving blood for this and that and the other, and was having clamps done, and all the rest of it. And so, went round, and discovered that loads of people had been taking blood out of Robert, and actually that we’d started to bleed him to the point when he was anaemic. Went round to Robert, and said “do you realise that we’ve just spun your blood down and you’ve got a haematocrit? Your haemoglobin is less than ten. You’d better go on iron”, and so on. And I had to go round everyone and say “look, Robert’s out of bounds. You can’t keep on bleeding the boss ’cause he’s got anaemic”. So, that was one of those, sort of, ludicrous things. I used to give blood for insulin-free plasma, as well, on occasions. And I remember, on one occasion, I’d put a butterfly into my arm, which is a little needle. And actually, having said I never fainted again, this was the one exception, because I’d got a huge syringe attached to this, having inserted it into my own arm, and was pulling blood out of my own arm, using the two hands, but with the butterfly into my forearm. And I suddenly realised that, actually, I’m going to faint, and this is a crazy thing to do. But, of course, knowing what to do is to lie flat on the ground - you can’t faint when you’re flat on the ground, that was what the



anatomy demonstrator taught me - so I lay flat on the ground, and continued to pull the blood out of myself, for this insulin-free plasma. And I remember Robert Turner coming in through the laboratory door, and seeing me on the ground, with a syringe in my hand and a butterfly in my arm, and just looking round the door, seeing me lying there, and then just retreating again, on the basis that he wasn't interested in what was going on, but he certainly wasn't getting involved in that. And I always thought that's a fantastic thing for the boss to do, is to just sort of back out of the door and walk away, on the basis of "I don't know what David's doing, but I don't think I want to know".

(8) Can you talk about UKPDS?

Now, UKPDS stands for the United Kingdom Prospective Diabetes Study, and this was dreamt up by Robert Turner in 1979, while he was in India at the European Association for the Study of Diabetes. Strange that that should have been in India, but that's where it was. He'd got diarrhoea, and so he was confined to his room. And he wrote out a little thing on a small piece of paper, which still exists, saying maybe we should do a big trial to find out whether, in fact, sulfonylureas or insulin was the best way of treating people with Type 2 diabetes. And that's what the United Kingdom Prospective Study looked at. It tried to take people who were newly diagnosed with diabetes, give them either conventional treatment and allow the blood sugar to rise, or to try very close control of their blood sugar by giving them insulin, sulfonylureas or Metformin, which were different ways that one could approach this. It should have taken about ten years, and that was the original aim. I say it was the original aim; I think the original aim was for about five years, it extended to ten, and, in fact, it ended up at twenty, which reflects back on the amount of time that Robert needed to spend in trying to raise money for it. And there was some statistic about him having sent off his own weight in paper, in grant applications, but I suspect that that was for a year, or something. I'm sure he's sent many, many more kilograms than that, over the lifetime of the UKPDS. He hung on in to make sure that it was finished and published, against, really, some quite vitriolic, embedded opposition from a large number of people. People used to say "oh, well, all this money's going off to the UKPDS, and therefore there's no money available for other research projects". "Other research project" is coded message for "I didn't get my grant this time, and it's Robert's fault". So, the UKPDS was really the biggest, and the most definitive, outcome trial of newly diagnosed Type 2 diabetes, and has proved to be the cornerstone of the evidence base for so much of what we do, today, in Type 2 diabetes. It established, beyond any reasonable doubt, the fact that you should try and get pretty good blood sugar control early on. And the post trial monitoring, that Rury Holman managed beautifully, demonstrates that the early treatment was worthwhile. I should say, at this stage, that Robert could not really have done the UKPDS without Rury Holman. Robert was the, sort of, big brains behind the inception of all of this, but Rury was the person who kept Robert on the straight and narrow, in terms of keeping the data beautifully managed, cleaning the data all the time, making sure that, over twenty years, as processes improved, new assays were introduced

and that the old assays were updated, so you always had current data. And Rury was - of course, we're talking the period, when you talk 1979 onwards, where computing was really in its infancy - and Rury was the person to manage all of the databases for this. The databases, originally, for the UKPDS, started off on lots of sheets of paper, and so on, and rapidly moved to a proper format. But, it was quite interesting that they were, even early on in the UKPDS, talking about punching data, using the old term of where you would actually punch holes into bits of paper. And, of course, my research career covers all those things, where you had punch cards as a way of sorting data, and, indeed, you used to have this ticker tape coming out of the gamma counters for insulin assays, which had holes punched in it. One of our MLSOs - Melanie Burnett, who I mentioned a moment ago - she could actually read ticker tape punched codes; to read standard curves off these. And she used to sort of look at the punched tapes, and say "oh yes, that's quite a good standard curve, and that will do nicely". Amazing - I've never known anybody else ever be able to read punched ticker tape.

Now, Robert published the UKPDS, to huge acclaim, in 1998. The trial ended in 1997, twenty years after the first patient had been recruited, and it took a year to really sort out the data. But the UKPDS results were published, in Barcelona, to huge acclaim. The presentation, alone, took two hours to present, and the hall was completely packed. Again, Rury Holman was instrumental in managing so much of the data presentation, at that stage. I remember him working deep into the night, changing the format of the presentation after discussion so that it was clearer, or that new slides were made, new graphics, and so on. And it was a huge privilege to take part in the presentation of those data. My involvement in the UKPDS - I had been part of the advisory group, I'd also done quite a few clinics, early in my life, with the UKPDS, and I was a co-investigator from the early nineties - but my part in the UKPDS was very small, compared with Robert's and Rury's. And the two of them, between them, had done the most magnificent job, and the UKPDS will stand for ever, actually, as being the way to run a trial, and extraordinary that so much of what we understand about how to run trials, now, was learnt from that. Robert Turner tragically died in 1999. He had a stroke while he was actually away in the United States on a lecture, and didn't turn up for the lecture in the morning. And, tragically, they went back to the hotel, and knocked on the door, and got no answer, and I think let themselves in, and discovered that he'd died... that he'd had a massive stroke. He died within a couple of days of that stroke. He never really... he never recovered out of that. A huge tragedy. The only thing one could say is that the greater tragedy would be if he had recovered partly, and lived on with a stroke. Robert was not someone that liked, ever, to think that he was other than immortal, as it were. He was... it was part of his competitive nature. Just to illustrate that, I remember, on one occasion, that we were going across to the physiology labs - I can't remember why. We'd decided to meet someone over in physiology, and he and I went from the Radcliffe Infirmary to the physiology department. This is, I don't know, it's quarter of a mile, or something, it's relatively close. And halfway across I'd realised that my shoe-lace had come

undone. And we were in a slight hurry, and I just stopped to tie up my shoe-lace, and Robert said something to me, like “oh, you’re just tying your shoe-lace up as an excuse for falling behind in the race”, or something. And I sort of looked at him, and he was quite serious. It’s as though, sort of, there was a race to get over to physiology, you know. Why didn’t we compete as to who could get there first, and, you know, this was just my ruse to pretend that I’d got some, as it were, disability with my clothing that was impairing me. And I just sort of thought, well, you know, not everything is a competition, but, actually, everything for Robert was a competition. Led to one or two incidents, which shouldn’t really have happened, between Robert and the people that he worked with, because he was too competitive. I say too competitive; you can never quite be too competitive, as an academic, and the whole of academic life is full of alpha males. Some of them are female, but you know what I mean by alpha males. It’s that attitude of needing to win, which other people have described as the killer instinct - as being a good thing. You know, I’ve been told, explicitly, that, you know, my career has not been particularly good, because I lacked the killer instinct. I did mention, earlier, that as head boy, I learned some things about leadership, and one of the things I learnt very clearly, as head boy, is that actually, the killer instinct is not the right way to lead people, or indeed it’s not even the right way to think about managing anything at all. As head boy, at Chigwell, you had, essentially, absolute power, and it’s a mistake to wield that. And it’s a mistake to become an alpha male to the extent that you think that the competition is where it’s at, in any form of academic medicine. The reality is it’s not, and I’ll, again - when we talk about the Oxford Centre - talk a little bit more about that, as well.

(9) What did you do after you worked with Robert Turner?

I worked with Robert Turner up until 1992, and, at that stage, my Senior Research Fellowship with Green College had expired, and I was really putting together a salary of my own, from consultancy and from doing research. Not a very stable way of doing things, but reasonably successful, in terms of getting money in. Nevertheless, the main consultant in the National Health Service, in Oxford, Derek Hockaday, retired in 1992, and I applied for that position, and got it. And I was pleased to get that. It was a change from being an academic researcher to being a full blown consultant, running my own enterprise. I’d, during the time of my training with Robert, I’d spent a year, full-time, being a research senior registrar on the wards, and I’d done quite a lot of clinics, and I’d been on medical intake call throughout the time of that work with Robert. So, I was fully fledged and accredited as an endocrinologist and diabetologist, at the time that I took over that post. And within a year of me taking over, Chris Burke, who was the endocrinologist, also retired. And so, within a year, by 1993, I was clinical director; in other words, I was the senior medic running the service, both for endocrinology and for diabetes. And we replaced Chris Burke with John Wass, who joined us from London, at that stage, to run the endocrinology service.

I’d realised, taking over as consultant physician, that - I took over one small

room, which was Derek Hockaday's study, as it were, in the hospital; his room. He'd got one small room, with a couple of secretaries, and there was another registrar's room - and I recognised that it was no way to run diabetes, just by turning up at clinics on a Friday afternoon. And so, what we needed to do was to run something that would run every day of the week, and that was the plan behind the Oxford Centre. And the Oxford Centre was put together in a very short time. I reckoned that we needed about half a million pounds to refurbish the old physiotherapy and the old accident and emergency department in the Infirmary, and I got permission to do that from the Trust. We raised half a million pounds in half a year, refurbished all that area, and so, by 1995, we'd opened the Oxford Centre in the Infirmary, which was a big step forward. We'd got our own consulting rooms down there, we'd got our own reception, we looked after our own patients, we'd got our own podiatry there, we'd got a small seminar room, a room for the registrars, rooms for endocrinology, and research. And we'd really transformed the clinical delivery to something that would run every day. One of the things that we introduced, then, was that we asked the secretaries if they would take on clinics in their entirety; in other words, instead of just typing up letters from doctors dictating on a clinic, that they would be the person that would be at the front desk receiving the patients. So, not only would they be typing up the letters about the patients, they'd also know the patients. That meant that when the patients phoned in, they would talk to someone who actually knew them, who'd actually be able to allocate them to the clinics, and who they'd actually meet when they came up. And so, we started to move from something which was very impersonal, to something which was very integrated and direct.

There are a number of things that happened. One of the things was that we'd stopped doing outpatients in the John Radcliffe. The outpatients in the John Radcliffe, under Derek Hockaday, had run on a rather cumulative basis, by which I mean that anyone who had diabetes was pretty well allocated to a big clinic on a Friday afternoon. The big clinic used to get bigger, because more and more people got diabetes. And Derek Hockaday used to, sort of, round up anyone like myself, who might be doing research, and say "please come and help me with the clinic". And other people would come along, who were in other departments, who knew about diabetes. So, you'd try and get as many medics along as you could. And then there was a huge pile of patient notes that would accumulate. The idea was that you took the next set of notes off the top of the pile, and the nurses were instructed that when anybody turned up, they would put the notes at the bottom of the pile. So, basically, you'd work through the pile, and there was a logic to when you'd turned up. Of course, if you wanted to be first to be seen in that clinic, it was no good, necessarily, just turning up at two o'clock, when the clinic started, 'cause you wouldn't be top of the pile. The way to be top of the pile was to turn up, say, half an hour earlier. But actually, lots of people would turn up half an hour earlier, so eventually people would turn up at noon, to be the first person in the pile. And so, they'd have to wait two hours to be seen. Anyone turning up at two o'clock would never get seen until

about four o'clock, because they were way down the pile. So, the result of all of this system was that everybody, without fail, would wait at least two hours, nobody would ever get seen on time, and there was chaos that used to roll on late into a Friday afternoon, to everyone's irritation. The first time I took over as consultant physician - of course, I turned up at one of these Friday afternoon clinics - and I stood on a chair, and said "look". I said we wouldn't be running the clinics in quite the same way again, that we would try and allocate times for people. But, I said, "if anybody wants to go away and have a cup of coffee or something, because there is, I understand, a long wait, and I'm very sorry about that", they could go off and have a cup of coffee. I said "just tell the nurses, and we promise that you won't lose your place in the queue". Nobody moved at all. It was just one of those things that nobody moved, nobody believed that they wouldn't lose their place in the queue, so they just sat on through that. But we did change things around.

Now, it's not to say that, with clinical care, that you can necessarily see people on time, all the time, and one of the targets that the Infirmary decided to investigate was how near to the time when we had agreed to see someone we actually did. This was at the time that we were running the diabetes centre, so we'd, by then, got lots of allocated times, and we would see people on their allocated times, if we could. But, of course, if you saw someone who needed a bit more time, then you'd get a bit behind, and we realised that the thing to do was to hand out coffee to people. What you do is, you say, "I'm terribly sorry, but we're about half an hour behind, but have a cup of coffee". And all the secretaries, of course, used to like this, because they were running the clinics, and then just say "oh, have cups of coffee". Now, coffee costs... a teaspoon full of some brown powder that costs virtually nothing, some hot water that's available from an electric kettle, and a tiny bit of milk, but it's amazing what this does to people's state of mind, the idea that you might be given a, sort of, free cup of coffee from the clinic. And so, we never used to have people complaining about being late, 'cause the fact is that we always used to look after people, and say "look, we're sorry that you're late". And they knew why we were late. It wasn't that we were playing cards, or that we'd decided to go off and do something else. It was that the person ahead of them, immediately, or at least someone further ahead of them, had needed extra time. And then everybody used to know that if they needed extra time, we would hang on in there until we'd sorted that lot out. And so, if there was people behind time, then that was the way it was; it's always difficult to run clinics on time. The Infirmary came along and said that they were going to monitor exactly how late people were. And I said "well, do we get additional bonuses if we see people early?". And they said "no, no, no, it's only about seeing people late". And I said "well, this is a very strange system whereby you can only fail, you can't over succeed. I mean, how can you compensate for that?". But anyway, they weren't interested in that, they were just interested about late people. So, they said "we're going to come round, and we're going to see how late people are". And I said "that's fine, just tell me when you're going to do it, because", I said, "I will get a handbell, and every twenty

minutes” - which is the distance that we’ve placed between the patients - “every twenty minutes I will insist that this handbell is rung. And then we will all say to our patients: I’m terribly sorry, Mrs Smith, but the bell has rung, and here’s the door, and we’re going to see the next patient”. And, I said “I’m serious that we’re going to do this, because if you think that a decent clinical service is going to be measured by whether we see people exactly on time, or not, then we can always shove people out of the door, and have a terrible clinical service”. And I said “and secondly, you know that I’m not joking about this, don’t you?”. And they looked at me, and said “yes, we do know you’re not joking about this”, and so they never did it, they never did it. And I’ve always reckoned that this is the way to manage late clinics; it is that you go out, and you either announce yourself, or you get the secretaries to announce, saying “I’m terribly sorry that we’re behind”. You give people a reason that we’re behind: “I’m sorry that one of the doctors has broken his leg”, or whatever it turns out to be, if there’s a particular reason. Or otherwise, you just say, and then you just hand out coffee and tea. And, basically, handing out coffee and tea transforms everyone, because they actually recognise that what you’re doing is looking after them. I’m keen on that approach to looking after patients.

Had lots of fun down in the Infirmary, but I recognised that it wouldn’t last us forever, and I’d reckoned that, actually, the diabetes centre would only last us ten years. And so I started, immediately, to plot what we might do next. And what we wanted to do next was the Oxford Centre for Diabetes, Endocrinology and Metabolism, which we started off thinking we’d probably need four million pounds, but actually, as we started to plot about what we really would need for this, it was nearer fourteen million pounds, which is what we did need. But we reckoned that, because the Infirmary was going to be moving up to the John Radcliffe, that this was the opportunity to use the plan to be the first people out of the Infirmary, not the last. I reckoned that if we were the last, we would get nothing, which, in fact, turned out to be true for the geratology department. They were the last out, and people had run out of money by then. But we were the first out, and not only were we going to be the first out, but I recognised that the NHS simply could not afford to pay for what we wanted. And so, instead of hanging around and trying to negotiate with the NHS for what we thought we wanted, I went out and fundraised. And we were lucky, in that respect, to have people like Stig Pramming around, from Novo Nordisk, and Jeff Goulder, and people who locked into the vision of this. And I had many happy hours with Stig Pramming and with Jeff Goulder, and other people from Novo, negotiating the first four million pounds, which they gave us. And then Takeda came along, very quickly afterwards, and gave us another four million. We negotiated with the National Health Service that our pro rata aspect of the space and the embedded space that we would take from the Infirmary would be worth about three million pounds. And then we’d got moneys from other sources, including Merck, who helped us with the Robert Turner Lecture Theatre, and Sainsbury’s, who helped us out with the library, and other definitive donations. We’d got quite a lot of smallish donations in, but, in fact, our fundraising had always been directed, for

the Oxford Centre, as not being a population based one. We'd tried that for the Oxford Centre, rather than for OCDEM - shaking tins, and so on. It's a miserable thing, actually. You shake a tin, you get wet and cold, and you get about, sort of, you know, nine pounds and twenty three pence and a button. And this is just a complete waste of time, because, actually, you'd say "but look, I could have had an evening in, and I could have just given twenty quid, and I'd have paid double that for just taking an evening off and not having the misery of sitting out and shaking tins". So, I think, for fundraising, you really need to think in terms of people signing cheques, and not throwing coins in your direction, as... We've had various people who help us with fundraising, and they're more or less focussed on understanding that, that what you don't want to do is to, as they say, 'nickel and dime your way' into getting this funding. You can't get fourteen million pounds by shaking tins, I can tell you.

(10) Talk about the new OCDEM building.

So, the Oxford Centre for Diabetes, Endocrinology and Metabolism, or OCDEM, was planned in the 1990s, and we eventually moved there in 2003. The build started in about 2000, at a time that I was then elected, by a joint NHS and University appointments committee, as chairman of OCDEM. The problems with OCDEM were not the problems either of the move, or indeed of the inception. The problems were earlier than that, when we started to go round to people to talk about the whole idea of what it is that we might do. And the idea was, surely what we need to do is to bring the clinical care, and the research, and the teaching, under one roof, for diabetes and endocrinology. And the vision, there, is one of collaboration, and it's fairly straightforward that collaboration would be the way forward. Nobody was interested in this. I say not interested; they'd pay lip service, but in reality, you could see that they were bored by this. And it took me about a year of talking about collaboration to realise that, actually - as I mentioned before, we were dealing with alpha males - and alpha males not interested in collaboration, I can tell you. They are really not interested in collaboration. Academics don't like the idea of collaboration, however they all do it, so what's going on? And the answer is that your competitiveness increases, if you collaborate. In other words, the reason for collaboration is, if you collaborate, you're more competitive, and you can get more grants, and so on, if you collaborate. So, that's why academics collaborate. It's because they can get grants that way, and if they don't collaborate, they don't get the grants, so they collaborate. It's forced on them, but deep down, inside their gut, they're trying to plough their own furrow. It's both the benefit of research, which is its competitiveness, and it's also its catastrophe. One of the things that you see, at international meetings, is people, both being stimulated by the academic generality of people around them, and also you see them grinding their teeth, thinking "I could have done that better, and why did I share my research ideas with them?", and so on. And these things happen simultaneously in people's minds. So, once I'd given up the idea of talking about collaboration, I talked about competitiveness. And then everybody started to think "yes, that's absolutely right. We'd be much more competitive if we had a base together

that we could then beat the world". So, the idea of then putting up something that would beat the world, in terms of output and everything else, was the idea. We, at one stage, thought we would be the International Centre for Diabetes and Metabolism, but we realised that hubris was not really to be countenanced, either, and that if we were going to become international, other people had to point out that that was so, and we couldn't do that by just announcing it.

We'd managed to get enough money together, and by the time that we'd sorted out all of the complexities of the accommodation, which were huge - we were trying to bring a university and then NHS organisation together under one roof. The National Health Service doesn't like research, or at least didn't, and probably still doesn't, deep down inside its corporate head, because it's trying to deliver very large amounts of clinical care, and it doesn't like its clinicians getting distracted into research. That doesn't quite go with a rhetoric, which I'll talk about in a moment, about the NIHR, which is a very good thing. But, in general, trusts don't like the idea that their clinicians are getting involved in research, because they think it's a distraction, and, in general, the university doesn't like its academics getting involved in clinical care, because they want papers and they want grants, and so on. So, there's a pull in that direction. As for teaching, then neither of them want to do teaching, really. The university doesn't want to get involved in nasty things like teaching, and certainly the Trust doesn't think it's its business to be doing teaching. So, if you're not careful, your medical students get completely the short straw, and all of this. And again, in Oxford, one, I think, needs to take a very clear view about getting people specifically to take on the tasks of teaching in medical schools. And certainly over things like the graduate entry, and so on, one needs people who are going to take that on full-time. So, we'd come together and managed to form a team, which was the management team of OCDEM, both from the University and the NHS side of things, and I was chairman. I certainly didn't want to be director. Again, what we needed to do was to have a rule by consensus, and I think that that's worked extremely well. Again, if you've got alpha males around - and I'm not using that in any sexist way, there are females who fall into that category, as well - the thing to do is to have a management team, whereby people will agree around a table. And you try not to vote on things, because you don't want people coming out afterwards, and saying "yes, yes, yes, but I voted against that". You want people to agree after discussion. And that's worked pretty well, over the years, with OCDEM. And the challenge that I had, and that will be the challenge for the future for OCDEM, is can you manage to balance the teaching, and the clinical care, and the research, in some equipoise? It's a tremendous task to do that, and I think it's going to take a lot of effort to try and make sure that it doesn't collapse, in one direction or another. And the tensions are straightforward. The tensions are: NHS is going to run out of money, so why don't we pull away the clinical stuff? Universities are saying, you know, it's still all about best quality of research: "We desperately needs grants, we desperately need publications. Have you published in Science and Nature?", and so on. So, tough, I think, in terms of the politics.



However, in terms of the personalities, we've done amazingly well, within OCDEM. We recruited Mark McCarthy, from London, and we recruited Patrik Rorsman from Scandinavia, to come over as a new scientist. We'd got Rory Holman running the Diabetes Trials Unit - the DTU - that he'd essentially expanded, after the death of Robert Turner. Jonathan Levy had taken on the clinical directorship of the department, very successfully, and has been a very safe pair of hands. John Wass has been a luminary, in terms of clinical care in endocrinology, and has done a huge amount of clinical research. Keith Frayn had moved the whole of, what was then, the Sheikh Rashid Unit up to OCDEM, and had continued to be extremely successful in producing definitive papers about lipid metabolism. Andrew Neil, coming from the Department of Community Medicine, and being a professor there, had contributed a lot, in terms of both trials experience, and also experience in lipids. And he ran the young diabetes service in OCDEM. So, we'd got really outstanding people taking on big amounts of work. We'd got pure scientists, with Anne Clark doing a lot of cellular work. Additionally, we'd got Raj Thakker, that we'd moved over from the Botnar Centre, doing academic endocrinology. So, altogether the population of researchers has expanded, and there are good people coming along in the, sort of, second wave of academics: Anna Gloyn really doing some splendid work with genetics, and Andrew Farmer doing work in primary care, and we've got an association with Paul Johnson, who is the Professor of Paediatric Surgery, and is helping us with the islet transplantation. I should say that DRWF funded, at one point, two million pound investment in us building the first fully European-compliant islet isolation centre, in the base of the building.

(11) And can you describe the facilities in the new building?

The building was designed by Gordon Kirtley, who I have a huge regard for. He died before the building was fully commissioned. He worked with us on how to put the building together to achieve what we wanted, in terms of its function. And there are various features of the building, which I think are outstanding. One is that he said that he would design a joke into the building, which I had never come across an architect say before. And the joke is that, actually, if you come into the building, you come into the corner of a triangle, and it looks as though it's going to be a very small building, because you can't see anything of the building at all, from where you are coming in. And you come in through a sort of narrow, low passage, and suddenly the atrium opens up for you. And he said that as people cross the line, which he told me on the plans, people would smile, and indeed they do. You can stand on one of the internal balconies and watch people smile. If they've never been in the building before, it always makes people smile, and I think that's a tremendous thing to have in a building. We also wanted to have a building which was full of light, and again, the engineering of this is that there's virtually nowhere in the building that isn't lit by natural daylight. There's none of this deep build, where you end up with artificial light all day. Everybody has daylight all the time. It's got a research unit that we designed on the right of the front door, which is a clinical research unit, which we'd funded, and which we gave to the NIHR - of which more later - effectively

as a gift to them. And they now fund the activity of that.

We've got a twenty six-bedded ward, which originally we had shared with some renal patients. And one of my regrets is that three/four years ago, now, there was a push to reduce the number of beds on the Churchill site. And we were told that this would be a temporary arrangement, but that the chest unit should move on to our ward, which was very, very highly engineered. And, indeed, we moved from having about twelve patients in diabetes and endocrinology, which was one of the reasons for moving to OCDEM, down to six beds, altogether; that's three diabetes and three endocrinology. And considering that there were two consultants, that meant that I was down to having one and a half beds under my aegis. That has, unfortunately, persisted, and it's a great annoyance to me, and a great regret, that we didn't fight, at the time, because the reality is that the chest unit seem to have settled there. To my fury, there was a strategic review of the chest unit, where they decided what the direction that they should do, in terms of their clinical care, and they decided, unsurprisingly, that they rather enjoyed being in OCDEM. However, as strategic reviews go, I was appalled that, actually, our opinion hadn't been sought about this at all. And the reality is that, although I have a high regard for the chest physicians, the reality is that we fundraised in order to put that ward up, and now we've ended up with three diabetes beds. So, I'm fairly annoyed about that, but it just goes to show the extent to which one needs to be politically aware, and the extent to which a cash-pressed NHS can be avaricious, regardless of the way that history has been unfolding, and who has done what in the past. The building is tremendously friendly to people. It's got a wonderful lecture theatre, it's got a café information area, it's got a very nice balcony, where people can meet, and where we can have informal lunches. It's got very good, highly maintained laboratory facilities, large numbers of offices, seminar rooms, and so on. And so, all of the building has been really thought out very carefully, and built to high specifications. And, as I mentioned, as a retrofit, we put in the DRWF islet isolation facility, both being run clinically, now, by Paul Johnson, and the islets going off to Patrik Rorsman for physiological testing. So, I think that we're about the right size, we've got very good facilities. The clinical research unit is something that we wanted to put as part of the building, so that we've got dedicated beds, and that's now, as I say, funded by NIHR, which I'll come on to talk about now.

(12) So, talk about NIHR, and the other organisations with which you're involved.

So, NIHR stands for the National Institute of Health Research, and I'm a senior investigator in the NIHR. They give me a small sub every year to do that. And we'd put together a consortium, which was the bid as being part of the Oxford Biomedical Research Centre, that I put together with Mark McCarthy, and that gave us money from the National Health Service for doing clinical research. Now, the NIHR is a really smart political move, on the part of the health service, to get research done, which you need to do in clinical medicine, with some sort of accountability. Previously, the NHS had decided that they needed research done,

and they'd sort of pour money into the top of the trusts, and say "here's some extra money, because we know that you're keen on research". But this money used to just go into the general coffers. Every so often, the Trust would go into a panic, because the government said "tell us what you've done with the Culyer money". And they used to send round something saying "we need to know what you've done with the Culyer money", to people like me. And we would say "what Culyer money? We've never seen any". And they said "oh, no, no, no. We've got extra money for you to do research, so you must tell us everything that you've done, because clearly this is part of the Culyer system". This, you can see, is nonsensical. At one stage, they wanted to know every single pencil that we might have bought with Culyer money, and we just wrote back, and said "well, we haven't seen any money, and we haven't bought anything". However, what used to happen is that the trusts used to gather together all the publications that their clinicians had put out, and then send this back to government, to say "look at the number of wonderful publications our clinicians have produced, and this must be therefore part of what Culyer money was about". They lost patience with this, eventually, and said "look, we need money to go into clinical medicine that we actually allocate properly, and get reports back, and then we can see where the money's going". And that's what NIHR is. And it's been a huge success, actually, and has allowed clinical work to go on. Again, you had to be careful that... if you're not careful, you say "we want the best possible clinical research. I wonder who would do that?". Turns out to be, the best possible clinical research probably going to be done by your academic people, who work for a university. So, if you're not careful, you find that you've got another finance line that's run by people who are paid by the University. So, you just have to be a bit careful about those things. And I'm not necessarily sure that NIHR have been wise enough, in terms of making sure that NIHR money is really going into true clinical research, and is not just another funding stream. Having said that, I'm fully supportive of the whole concept of what you do, but I do think that if you're not careful, especially in places like Oxford, what happens is that your academics come along and say that "we're the best, clearly, in doing x, y and z, and your clinicians are only amateurs in research, and therefore we'll take the money, thank you very much". And then it's all done on a competitive basis with the University, and then your academics get all the money. Sorry, you understand what I'm saying about academics. It's not that... it's that if you're wanting money to do clinical research, then you need to be a bit careful about how you do that, otherwise you have effectively set up another medical research council, which hands out money to academics, and so on, to do those sorts of research. So, it's quite a tough call, for the NIHR, and I think that they'll have to feel their way forward, on that. But I'm fully supportive of it; a much, much better system than Culyer.

The other organisation that I'm concerned with, is part of the NIHR, is the UK Diabetes Research Network, of which I'm co-director. And we've done a lot of work with them in the research trials world. Now, unfortunately, the Diabetes Research Network was a network which was built upside down, and by that I

mean that if you and I wanted to put a network together, we know how we would do that: that I'd be doing some work about subject x, and so would you. And then we'd say "oh, look, actually, why don't we just join up, and join over certain things that we could do together. And then let's get x and y and z in". And then you say "well, that's a sort of group" - this is the collaboration that I was talking about. You put that together, because it's going to be better for research. And then you say "actually, we need an administrator, because there are five of us now", and then you might put a bit of superstructure on. Well, the UKDRN was - Diabetes Research Network - was built upside down, in as far as they appoint a director, and then he has sub-directors, and then he appoints people in charge of IT, and then they appoint people in charge of other things. And then they appoint local research networks, and then they have sub-managers for the local research networks. And, finally, you recruit nurses, who are going to go around and get people into trials, which is what the network is about. And so, one of the things that the Diabetes Research Network has got a slight problem with, I think it's got slightly too much superstructure. But what its benefit is, is to try and get people into trials. And the nurses, who are working for Diabetes Research Network, are doing a tremendous job of recruiting people into trials, which is absolutely essential, both for academic work, and also for industry, who are desperately keen to try out new medications, new paradigms of ways in which you might look after patients, and so on. And so, one of the things is that, if we want to be the best country in the world for research, we need to invest in recruitment. And if we want to invest in recruitment, it's no good just finding the people who are very, very willing, and they're going to put their hand up, or knock on your door, and say "can I be part of your research enterprise?". You need to go out and find people, and the way to find people is, in fact, to have some sort of advocacy about why trials are a good thing, both for the country and for diabetes in general.

- (13) It turns out, overall, that if you start to put stuff together, in terms of videos or other material, to say "would you like to get involved in research, in clinical research?", that about half of what you're saying can apply to any old clinical research. In other words, it's not specific. It's stroke, or mental health, or whatever, "please get involved in research". And about half of it's concerned with the specifics, you know, "do you... if you've got Type 2 diabetes, we'd desperately like to hear from you, especially if you're on Metformin", and so on. Those are the sorts of ways in which you might approach that. And this is all part of what's called PPI, which is Patient and Public Involvement in research. And what we need, from the patients and public, is involvement at two levels. One is to become involved, and help, actually, by helping to design trials, and helping us on committees, and, equally, to help make the case, and to be part of the case, for participation in trials. And I think that my view about participation in trials is that, a lot has been said about the rights of people for the NHS. You pay your taxes, you've got your rights. But there are some responsibilities that go with that, as well. And one of the responsibilities,

seems to me, to be the straightforward responsibility of saying “look, don’t you think it’s reasonable that people know how many people have got diabetes, and what sort of diabetes they’ve got, and what therapies they’re on?”. In other words, shouldn’t it be part of your responsibility to say it’s okay for us to use your data anonymously, for the greater good of people in the health service? And that seems, to me, almost to be self evident. But it’s very difficult to persuade people, because every time you say “well, let’s have a database of what’s going on”, everyone says “oh, we know what you’re going to do. You’re going to lose our data, or you’re going to leak it out to the Inland Revenue”, or some such factious argument about this. And the reality is that we should be able, very much more clearly, to identify people who’ve got such and such a disease. And, indeed, we should, I think, be in a position where people ought to be able to give us permission to approach them about trials, saying “we know from central records that you’re on Metformin”, or whatever it is, “could you help us with such and such a trial?”. Where every patient in the country knows that there are trials available, and wouldn’t mind helping out. Actually, participating in trials turns out, for almost everyone, to be a thoroughly enjoyable affair. And the enjoyable nature of it is that you learn a bit more about the disease state that you’ve got, and secondly, you meet people on a consistent basis. You’re always meeting the same nurse and the same doctor, because they’re interested in answering the research questions, and so you form a camaraderie that, actually, is second to none. And the UKPDS did this to such an extent, actually, that there were people who were really very, very sad when the UKPDS shut down, because they’d got so used to the whole idea of coming up to their clinics. So, we, in Oxford, have been very much concerned with the, sort of, advocacy side of things; that is the aspect of really trying to say, if you want to get people involved in trials, you’re going to need special literature, you’re going to need to make the case enthusiastically, saying “please help us”. You know, “this is important work that people are doing. We do need your help, as a patient, in helping us out with this”. And so, I hope that that will go from strength to strength. I think the research networks have done a good job, in terms of pulling together people from all around the country, to come together to form a successful union of local research networks recruiting into trials. So, I’m enthusiastic, and we’re involved in doing a lot of work with the UKDRN; again, part of the NIHR bigger family.

The other big organisation that I’m involved with is the Oxford Health Alliance. Now, the Oxford Health Alliance was put together, fully, six or seven years ago. Originally we came up with the idea of Oxford Vision 2020. We started off with an idea of saying, well, I wonder what people would feel that the world would look like in the year 2020? But, of course, Vision 2020 is not a very straight-forward way of thinking about diabetes, because people think of 20/20 vision. Of course, it was a pun on 20/20 vision - meaning perfect vision - and we were really interested in what the world would look like, in terms of health, in

the year 2020. And the thinking behind all of this comes out of epidemic chronic disease. Epidemic chronic disease is the issue that we've got a huge amount of Type 2 diabetes around now that we didn't have fifty years ago. There wasn't an epidemic of Type 2 diabetes in the 1950s, and there is now, so what's changed? And if we think in terms of saying that there's an epidemic, you can really think in terms of saying, well, if there is an epidemic, then something could be done to actually alter that in an explicit way.

- (14) Now, what has changed is the diets that we have, and the amount of exercise that we take; those are the major things. And we could go back, and we could stop the epidemic. And so, the Oxford Health Alliance came out of Oxford Vision 2020, to say this is... what in the world could we do to change the epidemic of obesity, and how could we improve the amount of exercise that people take? I'm enthusiastic on both fronts. We put a spiral staircase in to the... into OCDEM, as a way of actually challenging people to use stairs, rather than to use lifts, and that's been successful. You need to think in terms of architecturally... of encouraging people to put in architectural features, which actually encourage exercise. The spiral staircase, actually, was prohibited by the NHS. And we got it put in, because we said it's a fixture and fitting, and therefore nothing to do with the main building, which is just one of those things that the NHS can sometimes be short-sighted, in terms of the way that it views things. Now, the Oxford Health Alliance has done well. Out of that has sprung a thing called the Global Alliance for Chronic Disease, which is a group of medical research councils coming together to look at epidemic chronic disease. And I talk in terms of epidemic chronic disease, the World Health Organisation talks in terms of, what they call, NCD, which is Non-Communicable Disease. But this is a... it's a crazy way to talk to governments, in terms like that, because, you know, to say something is not something else, is not a smart thing to do. I mean, if we said that the world is full of females and not females, half the world would get a bit annoyed about that. And the idea that there's communicable disease, and then there's everything else, is not a clever way of pointing out to governments that there's a serious epidemic underway. And the use of the word epidemic is important, because an epidemic is something that governments - and almost everybody - recognises is something that's unusual, and could be stopped. Everyone knows an epidemic is something... it's a big, as it were, it's a tsunami, it's a wave of something coming towards us. Why is this happening? What could we do about it? Can we stop it? All epidemics can be stopped. We do this for 'flu, we do it for cholera, why on earth aren't we doing this for obesity? So, that's what OxHA is about.

Finally, I should say a little bit about Harris Manchester College. I, having been a Junior Research Fellow at Balliol, and a Senior Research Fellow at Green College, I moved, in the late nineties, on the invitation of Ralph Waller, to be a tutorial fellow at Harris Manchester College. At that stage, they had no medics, and I was taken on, partly, to see if we should try and take students into Harris

Manchester College as part of their graduate entry medical intake. And I was delighted to do that, and, in fact, this has been a very successful undertaking, and we've got wonderful medical students coming in every year - two or three every year - to do clinical medicine, through Harris Manchester College. But more than that, Harris Manchester College has decided that, really, medicine is one of the growth areas in academia. And so, with the help of Ralph Waller, we've set up the Tseu Institute, which will be a new academy, which will allow us to fund fellowships, both from the developing country across to Oxford, and vice versa. In other words, to build new academic areas in medicine in different parts of the world. But also to have an exchange fellowship of senior academics, with Oxford, where senior academics could come, for short periods of time, to write up work that they've got... that they simply haven't written up so far. So, Harris Manchester College is now taking up much more of my time, and I hope that we've got several million pounds promised to come into that new scheme of things. So, I think, in conclusion, then, I would say that I've had a remarkable life in academic medicine, throughout the years that I've worked in medicine. I've been extremely lucky to somehow stay in Oxford, against the odds, somehow, of just simply being here. And I've become a professor of diabetes in a way that I wouldn't have dreamt, especially in my years working with Roy Kay, when I thought I was going to be a neurologist. I sometimes say to people, maybe, if you come across a training fellowship in neurology, I should start doing that. It's been a huge honour, also, to work with so many clever and intelligent people. There's nothing more stimulating than being surrounded by people who are clever, and who are wise, and, indeed, in medicine, you run across a very large number of people who are explicitly altruistic, as well. And so, medicine fulfils so many different aspects of my life, in terms of saying it's something that I've always wanted to do, it's something that I enjoy doing, it's something that I think is amazingly worthwhile doing, and is something where, both in clinical care and research, we can always be doing better. And we can improve people's lives, outlook, and, indeed, the very fabric of their health.

- (15) And can you end by comparing the experience of a patient with diabetes, either Type 1 or Type 2, coming to see you when you first treated people with diabetes, and when you finally stopped treating patients with diabetes?

So, things have changed very much, over the period that I've been doing diabetes, and they've changed in a variety of ways. So, let me talk about the sort of psychosocial aspects, first of all. It used to be regarded as a matter of shame that people had got diabetes, and, to some extent, that hasn't quite gone, because people tend not to be as talkative about it as, say, they might be about, I don't know, arthritis, or something that might be more neutral. People think that there's some blame attached to getting diabetes, and, of course, that's not true, either with Type 1, nor, indeed, with Type 2 diabetes. Type 2 diabetes, because it's related to obesity, doesn't mean to say that it's some sort of punishment for a hedonic lifestyle. We've got something going on in our environment that we can change. So, I think there's been more openness about diabetes, than there used to be, and people used to be extremely secretive, and are less secretive.

I think things have changed, very much, in terms of monitoring. I think that there used to be very, very nasty ways of monitoring, with very sharp lances that you'd try and push into your finger yourself. And things like the finger prick devices, and electronic read-outs on meters, has changed people's ability to control their diabetes. When I started, people were doing lots of urine tests; very nasty and smelly things to do, and not sensible. So, monitoring has changed. Insulin delivery devices have changed. There used to be nasty glass syringes, and needles that people used to re-sharpen, and they've given way to proper plastic syringes, and then, in turn, to pens that you just click and they put insulin in. We're still injecting insulin. The inhaled insulin devices didn't turn out to be the answer that some people had hoped for. So, that's changed. I think our treatment of people with diabetes has changed a lot. As I described, the sort of ridiculous clinics, where there was just a, sort of, cattle market approach, and that any doctor could turn up just to see a load of people with diabetes. And you'd slog on from two o'clock on a Friday afternoon till half past six, until everyone was exhausted, and people got less and less care. I think all of that has changed.

I think a lot of things have changed over to the idea that primary care can look after most patients, which I think is true. I think primary care can look after, probably, eighty five percent of patients, maybe even ninety percent of patients. But I would say that, actually, you still need about ten percent, at any one time, maybe fifteen percent, at any one time, needs to be seen in a professional hospital setting, by people who really understand the complexities of diabetes. I think diabetes specialist nursing has changed. I think that we now have much more nurse approach to people's lifestyles, and I think the diabetes specialist nurses are doing a tremendous job, and they are absolutely essential to any diabetes services. It cannot be run from a doctor base. I think the same is also true of dietetics. I think that there's not enough dietetic advice and care. I think it's an under-funded service, within the health service, and that could be improved. But, I think, generally speaking, patients are much more content to come to diabetes clinics than they ever used to be. I think they're treated better, there are better medications. There are new medications, coming on-line, which are going to transform many aspects of diabetes, some of which, at least, are helping people to lose weight, as well. So, I think that it's been an exciting field, both from the point of view of therapeutics, the point of view of change of the way that we deal with patients, and patients' perceptions of the ways in which their care might be improved. I think, overall, the lot of people with diabetes has much improved, because of studies like the UKPDS, where we now know that it's worthwhile giving good blood pressure control and good sugar control. We know from trials of people, like Andrew Neil, and so on, that we've got... that we need to treat lipids very carefully in diabetes. And all of these things have direct effects on the number of complications that patients get. So, I think, actually, at the end of my career - and I've just put down my National Health Service commitments, and retired from the health service - I think, at the end, I would say that you see many more people who are in a better state



of health, later on in the course of disease, than you used to see. I think that there's still much to be done, in terms of ways in which we could minimise the number of complications that people get. But I think that, really, the outlook is much better than it was, even twenty five years ago, and I think that research, and therapeutics, and, indeed, changes of attitudes of people delivering the care, have all contributed to that.