

52. Professor Harry Keen

(1) Tell me about your background.

Well, my mother and father were a sort of classic hardworking Jewish Mum and Dad, determined to do their best for their kids, and give them a good education, a good start in life, and I'm terribly grateful to them for that. My father was actually born in England. My mother was born in Poland and came to England when she was about twelve or thirteen years old, and was spectacular in the way she learnt her English, so that she became a teacher, actually, by the age of twenty two or twenty three. And then married my father and had three children in Ealing - Hanwell, actually; one of the sort of dreamy suburbs in those days, and now totally engulfed in metropolis. It was an interesting, and actually quite political childhood, because one grew up during the Nazi era, as the dictators were appearing in Europe, and persecution of Jews and other unfortunates became increasingly evident as time went on. And one of my earliest memories, actually, is marching with my Uncle Jack - who was pretty left wing - in the Falcon Road in Battersea, shouting at the top of my piping little voice "Arms for Spain means Arms for Peace!", and "Down the drain with Chamberlain and don't forget to pull the chain!". It was on such that I was reared.

What about your schooling?

Schooling was a sort of standard schooling. I went to the local elementary school - St Anne's - in Hanwell. Not very memorable, but okay. I remember it reasonably well. And then on to the local secondary school - Ealing County School for Boys - having passed the scholarship, which there was in those days. And there... was there for a couple of years before the war broke out, of course, and then was evacuated with the school to Aylesbury, where I spent the next three and a half years. School was an interesting era, because I was pulled out of my family - in a sort of way, I suppose, people who are resident in boarding schools are. And life was really quite an adventure. I mean, the war was pretty awful, of course, but for a youngster, it was opening, in a way, quite a different sort of life. And those three or four years made an enormous difference to my development, looking back on it.

What sort of difference?

Well, it opened my eyes to other cultures. I mean, my family were not very Jewish,

(2) by any means. They were respectful and I guess they were believers, but not intense believers. But it was a... even in Hanwell, there was a certain sort of Jewishness about the way we lived. But Aylesbury was quite different. Aylesbury was a world, really without much in the way of religion at all. And interesting, because, of course - like so many school kids in those days - I was shunted from family to family as an evacuee. Brought them in ten shillings and sixpence a week, which really didn't

make them very rich. My parents, of course, supplemented that, and they were down to see me, you can be sure! And my sisters were evacuated, also - elsewhere though. So, the family was really quite scattered.

What were your parents doing at the time?

They were working away. My father was a tailor and my mother was really a sort of business woman. We had a number of shops - Keen's Cleaners and Dyers - which said "Keen to dye for you", which was one of our slogans. It came straight from my mother's fertile imagination. And sort of keeping that going was a full time job, especially during the war.

When did you begin to think about medicine?

Oh, very early on; really in the 1930s, when I was a kid. I belonged to a sort of Jewish Scouts movement called the Habonim, which means "the builders". Behind that notion was the idea that, as we grew up, we would go out and found a new home in Palestine. So, they were the beginnings of all sorts of things that happened later, of course. But that was an interesting and lively time for a young man - and a young woman; I mean, my sisters also were pretty lively in that sort of regard too.

And when did you think about medicine?

There, at those camps. I always seemed to be spending all my time in the medical tent, looking after people with sprains and sunburn, and so on. We really had no medicine in the family. The nearest we got to it, I think, was my uncle - my Uncle Jack from Battersea days - who was a dentist; one of those old-time dentists who never actually took a qualifying examination. Dentists didn't have to in those days. He was a very good dentist, so I understand. But, I was really very impressed by the ideas of medicine, and

- (3) the humanity of medicine, really. Even as a kid, I realised that it brought one into quite close contact with other people, and quite often people in distress, people in trouble, and that one could sometimes do something for them. Sounds awfully spiritual and goody-goody for a kid, but that's the way it was.

So, how did you set about becoming a doctor?

Well, after I finished school - it was in the later war years - and I had then, I suppose, one of my more difficult "crises de conscience"; and I still have it, I have to say. Should I have then gone into the army and fought for the things that I believed in? I mean, I was certainly not out of peril where I was in London, which was, of course, at that time, the recipient of an awful lot of aerial bombardment and attack, and so on. And so, I really wondered for a long time about that, but then was persuaded that the right thing to do was to become a medical student and help. So, I became a medical student and applied for places at St Mary's Hospital, where I was interviewed by none less than Mr Churchill's physician, Lord Moran, who then was - I think Sir Charles hadn't yet

been ennobled - but was the dean, and was a one-man interviewing committee. I mean, they didn't bother, in those days, with large committees and getting a cross section of opinion, and so on - it was just what the dean thought. And he asked me two or three questions: "Did I play rugby or football?". I said "no", as a matter of fact, I played soccer, and that was one down for me at St Mary's. But then I said "but I do swim, and I was schoolboy champion of London just before the war". "Ah", he said, "okay". I was in! I don't think it was entirely a matter of sporting activity, but I'm sure that didn't do any harm. And came into St Mary's at a time when it was really quite an exciting place. And I remember my teachers extremely well, and they were really quite inspirational: made a lot of difference to the sort of things that I did. I was very soon exposed to what you might call a sort of experimental attitude to medicine - a scientific attitude to medicine - rather than sort of classical 'gold-headed cane' approach to medicine. And the person who, I think, influenced me most of all - in fact, I'm sure did - during my student years was

- (4) George Pickering; later to be Sir George, eventually Regius Professor at Oxford. And at that time, one of the earliest professors of medicine at St Mary's, and a man with a very experimental cast of mind, whom I got to know after I qualified - and became a little bit more mature and a little less respectful, perhaps, as I grew older - and who confided in me. I well remember, on one occasion, when I was guiding him back to Oxford, back to the Regius residence - the 'Open Arms', as it was called - he confided to me that quite mistakenly, in the 1930s, he'd been a member of the New Party. Did I know what the New Party was? As a matter of fact, I did. It was the party started by Sir Oswald Mosley for those people who are too impatient with the Labour Party, and who moved into the New Party. And he said he was not the only one who was mistaken: Nye Bevan went in too, but they were only in for days, and he wasn't in for very long. Anyway, that was Sir George, who used to work with a chap... if you look at some of the early Pickering papers - scientific papers - from UCH, you'll see one of his co-authors was a chap called Hess. And that was actually Hess's brother - the Hess who escaped to England during the early years of the war - that was his brother, who, before the war, had come over and worked at University College with Pickering and Co. And when George Pickering was in a thoughtful or angry mood, he would march up and down the ward whistling the Horst Wessel song! So, an interesting character, who made an enormous impression on me, and, in fact, got me into diabetes.

- (5) And how did you get into diabetes?

Well, in an interesting and indirect sort of way. Pickering's great interest in medicine was in high blood pressure. And he had just concluded some really quite groundbreaking work with a number of people at St Mary's, in which he'd done the really rather obvious thing of going out into a population and just measuring their blood pressure to see what he could find; really to explore this notion that hypertension was a distinct disease, and differed qualitatively,

rather than quantitatively, from the general population. But the question was, everybody had a blood pressure, and some people's were higher than others, and those that were very highest were the people who had high blood pressure. Now, he read a paper, which said that people with diabetes had particularly high blood pressures, and that caught his eye. And he thought "now, there may be some way into the better understanding of high blood pressure if we look at diabetic families", so he looked around for somebody to do the legwork. And I'd just come out of the army - I'd spent two years in the RAMC in Egypt - and I'd come out of the army and was looking for an interesting job back at St Mary's, ideally somewhere in academic medicine, ideally doing something to do with a sort of research. And his eye lighted on me, and I was only too delighted to take this job. And my job was to measure the blood pressure of every diabetic at St Mary's hospital, and then also to measure their relatives' blood pressures: to get their mothers and fathers, brothers and sisters and offspring - their first degree relatives - either to come and see me at the hospital, or for me to go and see them in their homes. And for a couple of years, I did very little else than that. I tried, obviously, to keep up my medicine, and had two or three shots at the MRCP, which I did rather miserably at. But collected an enormous amount of information about these diabetics. What we found, interestingly, at St Mary's was that we had relatively few young diabetic patients - what we now call Type 1 diabetic patients, or insulin-dependent diabetic people. And George Pickering said "Well, that's because of Robin Lawrence out there at King's. All the youngsters go out to see him, because he's got such a fantastic reputation. I'll send you out to King's, and you can supplement your collection of families from the young patients there". So, he wrote a note to Robin Lawrence, who said "yes", he'd be pleased to see me. And then I went out to King's,

- (6) on an occasion I remember quite well, because Robin Lawrence wasn't there, at the time, unfortunately. And I spent some time with Wilfred Oakley - his number two - who really was not terribly interested in the sort of things that I had in mind. He wasn't against them, but he certainly wasn't for them, and said, well, I better come back and meet the old man himself, which I did, and to my great delight. I mean, he was just the most remarkable fellow, I thought, who, of course, had diabetes himself. And that was only part of his remarkableness, if I can put it that way. But it certainly gave him insights into being diabetic - the minuses, of which there were many, and the pluses, of which he found as many as there were - and was able to transmit this understanding of diabetes to the people he dealt with; to his patients. And they recognised, in him, a person who not only had diabetes, but could communicate some of the feelings and reactions to diabetes. It was no splendid thing. He knew darn well that people felt as if they'd been demolished by this diagnosis, and that there was a big job of rebuilding that had to be done. And he did it in the sort of, perhaps, rather paternalistic way that one did then, but with an understanding which infected people like me and those around him. And, which I would dare to say, really illuminated my life, so far as a

chronic illness was concerned, in a way that nobody else could or would have done. I'll just add a thought to that, and that is that one of the jobs that I'd done before I went to King's was looking after a tuberculosis ward. And, of course, in the late 1940s, when I was doing this, tuberculosis was rampant in the UK; and into the early 1950s, as well. And it was a disease of young people: teenagers, twenty year olds - and the wards were full of these young people. And I got my first very, very clear impression of what it was like to have a chronic stigmatising disorder. People looked at you, if you had TB. You weren't really terribly welcome in and around the family, and one began to understand what it was like. I have to say: perhaps being Jewish helped a little bit in that understanding. Here were sort of irrational feelings that people had about you, that one could begin to understand, perhaps, in a rather special way. I don't know. . .

- (7) I imagine meeting RD Lawrence gave you some knowledge of the history of diabetes.

Yes, it was like a view back into the past, almost. I mean, my own experience of diabetes, at that time, was as a medical student and as a very newly qualified doctor, and was relatively limited. But it was really getting to be quite dreadful, because, at that time, one was just beginning to see the real ravages of long-term diabetes. I mean, the miracle of insulin saving lives had really just overwhelmed the public mind, and the feeling was that the problem of diabetes is now solved - Insulin is the answer, and we just don't need to worry about it any more. But, of course, nothing could be further from the truth, and one was beginning to see the blindness, the kidney failure, the high toll of heart attacks and stroke, and so on, that became really very familiar over the next few years. And I remember, very soon after I qualified, seeing a lady in her thirties who was in chronic renal failure, and, you know, whose prospects of life were very limited. There was no dialysis or renal support, of course, in those days - I'm talking about the very late 1940s or early 1950s. And again, my chief said "do you know what this condition is?", and I said "yes, this is the Kimmelstiel-Wilson syndrome in diabetes". And Pickering said "oh, that's absolutely right". He spoke with a slightly hesitant cough. He said "tell me, who were Kimmelstiel and Wilson?", and I said "oh, well, they were a couple of American physicians". And he said "well, Wilson was Clifford Wilson, a professor of medicine at the London hospital, and Kimmelstiel was a German pathologist, but apart from that, Harry, you're absolutely right". So, I was really put in my place. But it was a grim prospect, actually. And I must say, one of the most dramatic things that happened to me, slowly, over the course of the next twenty years, was the appearance of ways in which these awful hazards of diabetes could be counted; could be anticipated and counted. And that, of course, really marks what has happened to diabetes since insulin.

- (8) In the late 1940s, the people who trained you could probably remember the introduction of insulin, so how were they reacting to the emergence of these complications?

They didn't understand them. They wondered, really, whether this had to do with the diabetic state or with something else, and, for a long time, people thought this was really quite independent of the diabetes itself. And the question really arose - and it really wasn't settled until many, many years later - as to whether... how intensively - and we're now talking about people with insulin-dependent diabetes, Type 1 diabetes - how intensively you should treat them. In the United States, we knew that Dr Joslin had really very sort of puritanical views about the treatment of diabetes. You really had to rigorously weigh all of your food and try and keep your diabetes under good control, which was very difficult, because all you had, in those days, was urine tests to do that with, and they were pretty imprecise. There were no... I mean, you could do blood tests, but it took a couple of hours in a steamy laboratory to do them - so, on the basis of urine tests and the way you felt. I mean, I well remember Lawrence telling me that every well-controlled diabetic was mildly hypoglycaemic once a day - that, you know, it was like feeling the bottom of the swimming pool. You knew how deep the water was if you were mildly hypo; you knew your blood sugar was in a sort of reasonable bracket. And so it was. And, to a certain extent, so it still is. I mean, the really well-controlled diabetic experiences hy... not severe hypoglycaemia, but some hypoglycaemia once in a while. It's a dreadful reminder. And we'll no doubt talk more about hypoglycaemia. But, going back to those days, the prospect was awfully strong of young people losing their vision with diabetic retinopathy; of going into renal failure with progressive kidney disease - Kimmelstiel-Wilson syndrome, the damage to the filtering apparatus of the kidney that was so characteristic of diabetes. Or, of course, - and this began to appear too - the enormously increased risk of heart attack and stroke.

Was your impression, when you were a student in the 1940s, that consultants were warning patients or preparing them any way for complications?

No; in fact, the reverse. The doctor, I think, felt that this was a dreadful thing to be happening, and that they should be celebrating the successes of insulin, rather than bewailing this new and awful hazard that was beginning to appear. And it was felt that you weren't doing the patient any great service by warning them that there was greatly increased risk of blindness or kidney failure. And I remember arguing this with colleagues. And it wasn't till later, when, of course, it was clearly recognised that the level of control which you imposed on the diabetes made an enormous difference to outcome and to the development of these complications, that people could argue it is worthwhile, because people will then pay more attention to their control. Mind you, that's not an unmixed blessing either, because it raised all sorts of problems about success and failure with these things; about the enormous difficulty that it is to live with diabetes, and to maintain the superb levels of control that one would really want to do.

(9) So, moving on from the 1940s to the 1950s. What are your chief memories of the 1950s?

Well, it was, I suppose, the move to King's, which really cemented my concern with diabetes. I was enormously impressed by Lawrence as a clinician, an

understanding clinician, and also by his very direct techniques. He argued, for example, that if you wanted the patient to understand about diet, you had to teach them yourself, as a doctor; you couldn't just hand the patient over to a dietitian. And I learned all about the line diet and the portion diet, as it became, and also the sort of emotional support that people needed. And I learnt that, partly from Lawrence, but largely from the diabetic clinic sister, who carried the woes and anxieties of so many people with diabetes, and understood them, and was able to anticipate them and deal with them. And the staff there were a very understanding staff. I did... used to do three, or three-point-two, clinics a week at King's, and they were enormous clinics. I mean, we would all work together in one big room, with Dr Lawrence and Dr Oakley and Dr Robertson, and the various other doctors - Dr Helen Pond. Four or five, or six, even, doctors in the same room with our patients, sitting close to us and muttering to us, and trying not to overhear the mutterings at the next desk. And it sort of worked, but it was far, far from ideal. But we saw a great number of patients, of course. On one occasion, Dr Lawrence... round about eleven o'clock we used to break for coffee, and that was really quite important, particularly for Dr Lawrence, because I remember seeing him with a patient's foot on his lap, on one occasion. He was obviously examining the foot, and he had written in the notes "patient..." - in his own inimitable scrawl, actually, which seemed to get worse - "patient complains of pain in f-o-o-o-o..." It was quite clear that Dr Lawrence was in mild hypoglycaemia, and I said "I think it's time for your coffee, sir". And up the stairs we went to this room and had a cup of coffee and biscuits, and he was fine. So, it was a very communal sort of existence, and quite a warm one. And we called each other over to look at unusual manifestations of diabetes, of which there were many. And the other thing that was noticeable about that clinic was that there was a little eye examination room there, which was blacked out, which we took the patients to and looked at their eyes very carefully. And Dr Lawrence, I remember, had a book in which he'd drawn patients' eyes, over the decades, that he'd looked after. And he had some remarkable records of the patients' eyes. I guess, in those eight or nine years, that I served my tutelage - my diabetic tutelage - at King's, I really saw an enormous amount of diabetes, and some inpatients as well. And the rest of the time, of course, I was doing my general medicine, and some diabetes too, at St Mary's. And I was sort of commuting between the two. And that all came to a close, in a rather grand and dramatic way, at the end of the decade - 1960 - when I went off to the United States to do a National Institutes of Health fellowship.

(10) Just before we move on to America and 1960, a few more memories of the 1950s?

Well, I suppose one of the characteristic things about... that I recall about those clinics was that they were largely used by insulin-taking diabetic patients. It was not necessarily Type 1 - what we would now call Type 1 patients - but people who are treated with insulin. And, of course, that was... largely reflected the way in which diabetic clinics appeared in the first place, which was to distribute insulin amongst those who really needed it to maintain their lives, and to teach

them how to use it properly. And with so many doctors seeing so many patients in the same room, it was possible - almost impossible - not to make observations on how each of them proceeded. And the variation was quite extraordinary. One of our leading physicians would, on a good day, see, perhaps, ten or twelve patients, on a good morning, unless he met a pretty young diabetic lady, in which case his numbers would drop dramatically. And he would spend an awful long time with them, for the best possible reasons, I don't doubt. And others just ploughed through twenty five or thirty patients in a morning. They can't really have been offering them very much more than I think a well-trained Alsatian hound might have done. But the patients sat there really very patiently, and I felt a bit angry on their behalf, I have to say, on occasions. And I think it was out of this sort of mass clinic that the notion grew in my mind that we ought to do things differently; that diabetes really wasn't a one day a week disorder. It was there all the time and we ought to think differently. And I think the beginnings of the notion of day centres and day care really began there. They really didn't develop until after a visit that we paid to Berlin in the middle 1960s. And that was a very interesting visit, because, by that time, we had formed a new little organisation called the European Diabetes Epidemiology Study Group. That grew out of the Bedford study, which I'd like to talk about in a couple of minutes. But that journey... during that stay in Berlin - one day in East Berlin and one day in West Berlin. The wall was up, so we had to cross Checkpoint Charlie, which we did at midnight, and

- (11) thereby hang many tales as well. On that occasion, in East Berlin, Dr Schliack - Volker Schliack - who was the diabetes physician in East Berlin, took me to what he called, I think, his 'Diabetes Stellung', which was a house, which he had acquired, where his diabetic patients came and stayed for two or three days. And while they were there - members of the staff also spent much of their time there - they learnt about food, how to inject, how to test, and all of the other things that a person with diabetes had to learn. It was a sort of resident training course. And that struck me as an extremely good idea. And it was after that that - after I came back - that we started exploring the idea of a day centre at Guy's, and eventually opened our day centre. And soon after that, colleagues opened centres in Sheffield, in Aylesbury, in Colchester, and so on. So, the Diabetes Centre notion really grew out of that.

But, just back in the 1950s, it was clinic based. Where were non-insulin diabetics going? Was RD Lawrence interested in them too, or...?

Not very, no. His passion, obviously, was for people like himself, who were trying to make a go of life, and he gave them every encouragement. The non-insulin-dependent diabetic was regarded as a person with mild diabetes. Somehow, we just didn't see the dramatic development of eye, kidney, heart disease, and so on, in them that was so apparent in the youngsters with diabetes. And it really was many years before it came apparent that they were just as liable to these complications, to which was added some of the problems of the later years of life



anyway: the fact that blood pressure was likely to be higher, that the arteries weren't as clear in older people as they were in younger people, so that in many ways, they were worse off than the insulin-dependent patients. And also, of course - let's face it - people were not living as long then, there were not as many obese people around, so that Type 2 diabetes, as we now call it, was less common; much less common, I suspect. And, in fact, that was why, in 1962, we carried out the Bedford Survey. That was also a sort of diabetic turning point in my life. I came back from the United States to

(12) Guy's, to join my chief, John Butterfield, who was then running the unit.

Should we just talk quickly about America, to keep things in chronological order?

Yes. That was at the end of a year - or just over a year - in the United States, which I had spent in a most extraordinary environment in the National Institutes of Health, Bethesda, which was a sort of research city - at that time, with five and a half thousand graduates working in the place. Not all of them physicians - many of them PhDs, but all of them interested in disease and the biological sciences. And the National Institutes of Health, of course, was broken up into a number of institutes, which dealt with different body systems. And I was in the one that dealt with diabetes and arthritis, at that time. For some reason, or another, they were put together... well, I think largely because of Cortisone, which was... caused diabetes in some people. And had an absolutely spectacular year there. Scientifically, I had a wonderful time; it was like going to fairyland. I mean, from England, which was still in a state of some privation in the 1950s, and America had everything. They had radioactive counters - a couple on every floor, whereas we had one in the institution, which we all had to line up for. So that the limiting factor, in that year in America, was a frightening one, and that was the reasonable ideas that you could develop. You were really on your intellectual uppers, as it were, during that year. Very stimulating. But, in a way, it decided me very firmly that I didn't want to be separated from clinical care of diabetes for any great length of time, and that whatever job I did do, it would have to be with patients in it somewhere.

Right, and then what happened after America?

Well, that was, I suppose, the beginning of the most - I would regard - as the most productive decade in my life. A lot of things that I'd started in the United States, I came and was able to get on with back at Guy's, where there was an atmosphere of academic liberty, which I hadn't had, actually, at St Mary's. St Mary's being very rigorous, Guy's was very open-ended and inviting, and largely, I think, as a result of John Butterfield, who was my chief, but also my friend, and a great support throughout time.

What was your job title?

At that time... well, I was a lecturer, but I became - in short order - senior lecturer and reader, and, by the end of the decade, I'd got a personal chair, which I suppose was a reflection of the commitment that, by then, I'd clearly

totally made to diabetes. But, I suppose the thing that started that decade for me was the Bedford Survey. And the intention there was to see what the rate of undiagnosed diabetes in that city was. And it was occasioned by the fact that the Medical Officer of Health - a chap called Clive Sharp - had a rather developed view of what the Medical Officer of Health should be doing.

- (13) Clive Sharp thought that the Medical Officer of Health's time spent looking for typhoid, and such like - malaria - in the population of Bedford, was perhaps better spent looking at some of the more up-to-date problems that the public met with, such as diabetes, heart disease, and so on. And John Butterfield was a sort of natural ally of this, and together, with me, when I got back from the United States, we planned the diabetes survey, which took place in 1962. And the idea in Bedford was really to get every member of the population to leave a blood sample. . . sorry, a urine sample - a blood sample would have been difficult - to leave a urine sample outside their front door over the course of a weekend. And the organisation involved getting the local boy scouts, and Round Tablers, and Women's Institutes, and so on, to go around collecting these samples and delivering them to public health clinics around the town. And this was really, actually, pretty successful. We managed to distribute little sort of marmalade pots that they. . . little snap-on caps that people wrote their name and age, and so on, and address on. And these were collected by these scores of people. And there were those who didn't quite catch the purpose of this, and thought this was an appeal for funds, and put money into the pots instead of urine. And there was one wag who put sherry into the pot. And that was extraordinarily discovered by John Butterfield, who thought it looked a funny colour, sniffed it, and said "my God, this is sherry!". And we went round to the house, and sure enough it was, and there we finished off the bottle! But we actually got samples from something like 72, 73% of the population, which was really pretty good. But at the same time, perhaps the most important thing that we did was to take a random sample of that population and submit them to the standard test for diabetes: the glucose tolerance test. And it was really from that, that a great deal of new information came, because we found, when we looked at the way in which the results distributed, that it was rather like blood pressure results. There was no clear point at which normality ended and diabetes began. They just merged one with the other, so that there was this sort of area in the middle where you didn't know whether somebody had diabetes or not. I mean, right at the top end it was quite clear that they did, and right at the bottom end it was quite clear that they didn't, but in the middle it
- (14) was what we called a zone of diagnostic uncertainty. And interestingly, a person in the United States - a researcher in the United States - Kenny West, who later became a very close friend, had found exactly the same thing, when he asked doctors the sort of levels of sugar that they would need to make a confident diagnosis of diabetes. I mean, he found that, in the same street, there were some people who would tell a lady of fifty with

a blood sugar of a hundred and twenty that she definitely did have diabetes. And, in the same street, another doctor would say she definitely didn't have diabetes. So, there was a lot of uncertainty amongst the profession. And there was nowhere that you could actually... there was no figure... and it was quite clear why, because there was no clear dividing point. So, what we did in Bedford was to divide the population, not into two: normals and diabetics, but into three. At one end: the normals; at the other end: people with newly found diabetes; and in between: what we then called borderline people, and what we now call impaired glucose intolerance, IGT. And that was the birth of IGT; it was where IGT came from. And we took people with IGT and we followed them up for ten years. And we treated half of them with Tolbutamide, and the other half with placebo. We did a really long-term, double-blind, randomised clinical trial, which, in the early sixties, wasn't really bad going, I have to say. And we followed them, as I say, for ten years, and found that we didn't make an awful lot of difference, using the pills, on the rate at which diabetes developed. But we learnt an awful lot about the development of diabetes by following them closely. I mean, it was as a result of our following that group that we needed to develop very early tests of the development of the complications. So, we were interested, for example, in the development of kidney disease in diabetes, and we therefore worked on a way of picking up, very early, the amount of... the increase in the amount of albumin in the urine. And it was because of a rather lucky meeting that we attended, that we discovered a new method. The method, in fact, that had been developed by Randle and Hales in the UK, to measure insulin in blood, we applied to measuring albumin in urine. And, out of that, came the whole idea of Microalbuminuria - the very small increase, long before you got a clinical increase in albumin in the urine, which was a first clue that the kidney was being affected in some way by the diabetes. And that, of course, has been a great help to the understanding of kidney disease, and to the understanding of arterial disease. The other thing that I think we learnt a great deal about was how glucose tolerance affects heart disease. Not only was there a grading across the population in the amount of diabetes they had, but also their risk of developing heart disease, so that people with only lesser degrees of glucose intolerance, with IGT - with borderline diabetes - had this increased risk. And that is now recognised in what's now called "the metabolic syndrome", which has gripped the public imagination, and which was quite apparent in those very early days in people with lesser degrees of glucose tolerance.

- (15) And you said that your year in America had made you reluctant to stick purely with science, so what are your clinical memories of the 1960s?

Yes. I mean, it seemed to me that the science that we were doing really ought to be as closely applied to patient problems as possible, which is not to say that basic science isn't of vast importance, which, of course, it is - it's just the way I'm built. So, getting back to the clinic was really a pleasure for me, when I did

come back from the United States. And I suppose in that decade, in the sixties, it was the time that one began to see this increasing number of people with Type 2 diabetes coming into the clinics, and really making the clinics impossibly crowded. Partly, I suppose, because people were living longer, and partly because they were eating better, or eating too much. Partly because they were taking less physical exercise. And, whatever the reasons, the numbers were going up. In the Bedford survey, we'd found something like 2 to 2½% of the population, and, of course, the rate now - at any rate in a US... comparable US population - something approaching 8% of the population will have diabetes, particularly in an ageing... in an older population. So the numbers were large, and the clinics became unmanageably big, really. One just didn't have time to spend with individual people. And, really, this drove the notion that we ought to do things in a rather different way. I have to say, too, that during that decade, the patients - the people with diabetes themselves - were becoming much more articulate. I think, in the UK, largely because of the existence of the British Diabetic Association, which, of course, I was then increasingly involved with. The BDA was a great learning centre for me. One of the great joys of the BDA was that it brought the health professionals and the care providers, as we're now called, together with the people with diabetes. And we realised... began to realise that they, of course, are very important care providers in their own right, along with their own carers. And it was this sort of mutuality of dealing with the problem, really, that... I think the notion of that, that grew during the 1960s. And it, I would like to think, led the way a bit in the improved relationship between health professionals and their patients, so that the notion of a much more equal partnership started to emerge, and the realisation that, unless one had the patient as part of the therapeutic team, as it were, one was going to lose half of the advantage of the treatments that one had. In diabetes, that is so obviously true that one hardly needs to say it, and the amazing thing is that it took so long to recognise it. The Diabetic Association was one of the instruments for saying so, and, of course, in many ways, that was one of the reasons that it came into existence. I suppose during that decade too, one recalls travelling to the far distant outposts of the British Diabetic Association empire. Dark nights, Saturday nights, and giving talks to branch meetings of the Association on the latest diabetes research, always with a bunch of people who were extremely interested in what was going on, and who, of course, were supporting research by collecting funds, which they still do.

(16) And before we move out into setting up clinics in the community, what were wards like in the 1960s?

Well, they were still mostly the old Nightingale wards, with many beds on either side of the ward, although smaller sections were... segments were beginning to appear; very few individual rooms. People with diabetes, it was recognised, were, as it were, overrepresented in the hospital wards. I mean, at my own hospital, at Guy's, even at that time, something like 10% of the people in the hospital, at any one time, had diabetes. They weren't in necessarily because of the diabetes, but diabetes increased their length of stay, and also increased their risk of having

to come in, so that it was dawning on people that diabetes was really a problem that everybody was going to see. And I suppose this, too, was the beginning of the emergence of the diabetes specialist nurse. Let me just say: I've often said, without really too much exaggeration, I think, that the appearance of the diabetes specialist nurse was the most important thing in... for the person with diabetes since the discovery of insulin, and has made an enormous difference. Just the increase in numbers and the sort of long-term problems, and the need for explanation, education, motivation - which is so important for people with diabetes handling their own disease - really drove that along. And it was really in the... over those years, and towards the end of them, really, that it became so apparently impossible to push on with the sort of standard old-fashioned diabetic clinic, that one began to see the emergence of Diabetes Centres, which went on for longer than the half day a week that most big hospitals ran their diabetic clinics in. I well remember, during a visit to a hospital - the Hallamshire, Royal Hallamshire in Sheffield, at the invitation of my friend John Ward - I was very impressed by the fact that they had people with diabetes who came up to the ward - outpatients - who came up to the ward every day with diabetic problems, which were dealt with by the hospital staff, who didn't differentiate between their inpatients and their outpatients. It must have been quite a burden for them, but they recognised that this was them doing their job, and doing their job for diabetes. And so it was probably no accident at all that that Sheffield Diabetes Centre was one of the very first that came into existence, and led the way for many others.

- (17) The notion of the Diabetes Centre, which of course is still with us, in a rather modified way - and there are some things that need to be said about that, as well - really grew out, I think, of the growth of Type 2 diabetes in the population. The need to take people aside and spend time with them, and really to explain what was going on. And the notion that you could do that by seeing them every six months for ten minutes was just ludicrous. So, it was not difficult to persuade either the doctors or the patients; the problem was where the funds were going to come from. And funds were found: the British Diabetic Association, in fact, put a fair amount of money into founding the first few diabetic centres, really just to show the way. And then, local branches of the Association were really quite instrumental in collecting money and raising enthusiasm, and getting people locally to build their own Diabetes Centre, which they did in many cases. So that by the time the 1980s were ending, there were something like two hundred, two hundred and twenty diabetic centres in the UK, where people with diabetes were seen every day. And where, of course, this notion of the sort of specialist diabetes support staff - nursing staff, dietitian, chiropodist, and so on - really came into its own, where the diabetes team really started to form up. And one of the damaging things that's happened most recently is the way in which those, in a sense, have been threatened by the notion that people with diabetes should get their care from their general practitioner - from their primary carer. Of course,

they should - that's terribly important - but they also need the facilities of the Diabetes Centre. In fact, the two are a continuum, and it's terribly important that people recognise that. At the moment, they're thinking in alternative terms: either / or - you know, it's either got to be primary care or the hospital. It's got to be both for the person with diabetes to get the greatest advantage out of it.

- (18) Of course, this relationship between primary care - GP, home - and the hospital specialist team had been a matter of concern and importance for many years. I mean, even in the early 1960s, there were so-called 'mini clinics' developing, and these were largely dependent on the local diabetes specialist physician, as he was now emerging - there weren't any before - making contact with some of his local general practitioner friends, and the GP running a little so-called 'mini clinic', which the consultant attended. And they would see patients together, or there would be some division of labour, with more difficult troublesome ones being seen perhaps by the consultant. And these grew to quite a large size. I mean, there was one in Poole, which Ron Hill, the consultant there, was very instrumental in starting. And there were perhaps eight, ten - one in the Isle of Wight - where there was a sort of peripatetic consultant who moved out, and a lot of doctors started moving into the clinic and doing a diabetic clinic a week to keep their skills high, and to develop their own particular interest in diabetes. So, this sort of continuity between primary care and the specialist unit was not a new thing.

Did you have any first-hand experience of these mini clinics?

Yeah, I visited a few, and I was particularly interested in the Poole, the Ron Hill, clinic, and got to know the local GPs pretty well. The other person, actually, who was very active with local GPs, was Joan Walker, a physician in Leicester. She had a very interesting history. I mean, she was the diabetes person who was left in charge of the whole business of diabetes of Leicester when all the men went off to war, during the war. And when they came back, of course, they were not terribly happy to see her 'in situ'. So, she was sort of expelled from all of her hospital jobs in, I think, a very disgraceful way, actually. It's now far enough away to be able to say that. I think she was very scurvily treated for the contributions she'd made. So, being Joan, she decided she would make the best of things, and she got the local district nurses and health visitors, and so on, interested in diabetes, and started treating patients in their homes, with the help of their GPs, and worked quite closely the GPs. And, in fact,

- (19) Joan Walker did the very first diabetes survey in the UK, which she did in the middle 1950s in Ibstock, just outside Leicester, where, with the help of the local GPs, she surveyed the population for undiagnosed diabetes. She, of course, was the great founder member of what came to be the Medical and Scientific section of the British Diabetic Association. And that's... the origins of that, really, are quite interesting, because during the 1950s, it became clear that there was a lot of research that could

be done into... particularly into the complications - it certainly needed doing - into the complications of diabetes. And a number of my colleagues felt uncomfortable talking about these in front of patients. The scientific meeting of the Diabetic Association, at that time, was the annual Banting Memorial meeting, and every member of the Association - be they medically qualified or not, or a person with diabetes - had the right to attend that meeting. And I addressed that meeting myself, in 1956, I remember. I gave a paper on the inheritance of diabetes, with a certain number of lay people in the audience, and quite a number of the clinicians, really felt rather worried about talking about this emerging... awful emerging problem of retinopathy and heart disease, and so on. So, in 1960, a group got together - mainly, I think, spurred by Professor Philip Randle, whose recent death we're very sad about - to form a Medical and Scientific section, which was limited to healthcare professionals, where, in a sort of uninhibited way, we thought, we could talk more readily about some of the more dreadful things that happen in diabetes, and you can see the arguments. But, at any rate, that became a very vigorous limb of the British Diabetic Association, and still exists. It doesn't meet, now, twice a year, as it used to; only once a year. And there is one lecture, the Banting Memorial Lecture of the Medical and Scientific section, to which, by tradition, all members of the Association are entitled to attend, if they wish, so that the tradition is carried forward. But the Medical and Scientific section, of course, was the great rostrum from which one gave one's recent research results, and so on. And a great deal of important work was first displayed to the public, I mean to the medical public, in front of the Medical and Scientific section.

- (20) Right, well let's move on now, fully, to the 1970s, and tell me what the most important things happened during the 1970s.

Well, to me, and to many of us, it was in the 1970s that the sort of full impact of the complications of diabetes were beginning to make themselves evident. And also the fact that people with Type 2 diabetes were certainly not immune, and just as susceptible - that this was no mild diabetes: this was the full-blown business with the problems of amputation, blindness, kidney failure, heart attacks, and so on. Just as important, and just as compelling. So that a number of important questions really came up, which only people with diabetes themselves could answer... and work with people with diabetes themselves could answer. And the most important of all was the one that had been almost obsessing the diabetes community for many years, and that was the value of really tight control, and I mentioned this earlier. One might say, "well, you know, if there is any question about this, why not just do it?". And the answer to that is because it is not something you can do without paying quite a substantial price; and the person who pays the price, of course, is not the doctor, but the patient, whose life has to be modified. And so it was that one was really looking around for ways, particularly for people on insulin, ways of getting much better levels of control, without making life totally impossible for them. And it was getting easier, because, in the 1970s, one was beginning to use self-measurement of

blood glucose. Suddenly. . . well, not suddenly, but it became possible for people to measure their own glucose with their own meters, and to make their own judgements about what they needed to do about treatment. It took a long time, I think, for the profession - and for the diabetic public - to come to terms with this new facility they had, and to find out how best to use it. But, of course, it was a dramatic happening, and improved the ability of people to look after their diabetes quite remarkably. And there was also a certain revivalism, too, about. . . In the early days of the treatment of diabetes, in the really early Lawrence days, one treated diabetes with multiple injections of soluble insulin.

- (21) People like Lawrence himself, for example, carried their insulin around in their pocket, and gave themselves a shot of insulin before a meal. And it would be quick-acting insulin - soluble insulin - and the size of the dose he would judge on the basis of what he was going to eat. I know, because there was an occasion when I had to arrange to give this for him himself; after his stroke, he had some difficulty in doing it, and he told me the dose he wanted and I drew it up for him. "Be careful with that syringe", he said, "I've been using it for the last thirty years!", and it certainly looked like it, too. But, there weren't many people who were using multiple doses of insulin, in the seventies. They were all rather hypnotised by the long-acting insulins, which seemed to be more convenient, and make life easier for youngsters, and so on. In fact, the effect was to lose a great deal of elasticity in how you could treat your diabetes. If you used multiple small doses, you obviously could change the timings of your meals a bit, and the quantity of your meals a bit. It was liberating. But it was really towards the end of the 1970s that people began to recognise that there was value and virtue in using multiple doses of insulin, if you wanted to get good control. And the notion that life was impossible was just proved not to be true, and there were various ways in which people were able to establish that. John Ireland, in Glasgow, developed a little sort of pen-like injector, which you could carry around. Gets far less than his due recognition for developing the pen injector, does John. So that, you know, it was easier to carry around your daily supply of insulin. We did some very early work. . . I mean, I frankly didn't believe that self-measurement of blood glucose was good enough - was reliable enough - to judge insulin doses and responses on. And I was enormously impressed by this new reflectance meter, which was being made in Sweden, and which gave a value which was very close to the real thing. We did a study - we published the first paper - on the use of reflectance meters in measuring blood glucose, and it really worked very well. And then it was people that - Peter Sanderson, Bob Tattersall - who gave the meters to the patients, and said "take them home with you, and measure. . ." - first of all with pregnant women, and then with the general diabetic patients - "let's see what's happening". That really revolutionised things. People were now beginning to navigate the sea with a map. They knew where they were, and

- (22) could do something about it. We thought that it might be a good idea to



give insulin by a continuous subcutaneous infusion, and I... on a lady, whom I shall always remember and respect, Mrs Winifred Vincent - let her name go down in history - was the first one to be given insulin by continuous subcutaneous infusion; the insulin pump. And she was a lady in the ward. She was going blind with her diabetes, and was very poorly controlled, and I asked her whether I could try this. I told her I'd watch her like a hawk, and make sure she came to no trouble at all. But what I wanted to do, instead of giving her injections, was to put this little tube under her skin, and run the insulin in continuously. And I did that using an old Harvard syringe driver. And to my absolute amazement, her blood glucose came down, almost to... virtually to normal, and stayed there for the whole day. It was really a moment of revelation to me. The next thing, of course, was to find a small syringe driver that one could... that the patient could walk around with, that was portable. And it just so happened that I was going to a research meeting that evening, and I shared the back of a cab with George Alberti, and I said "do you know anybody who's got a little pump?". And he said "well, there's this chap, John Parsons, who's working at Mill Hill in the Institute of Medical Research, and he's actually giving fragments of another hormone to rats. And I know he's got a little pump because it sits on top of the cage and feeds down to the rat through a tube". I said "that sounds like one for me". And I went to see him next day, and he actually happened to have one, in his home, which he lent to me, and sort of the rest is history. I was joined by John Pickup, who, of course, made the pump his very own very special area of interest and development, and off we went. What we were able to do, then, was to show that, using this technique, we were able to get remarkably good levels of control in diabetes. And we are now into the 1970s, and multiple dose injection... multiple dose of insulin was claiming to improve control, and it became clear that with blood-glucose measurement, we were now able to achieve much better levels of control. So, John Pickup and I wrote a grant application to the National Institutes of Health, my old 'alma mater', as it were, asking for some money to run a big study where we randomised patients between using pumps and ordinary conventional treatment. Now, we had to randomise them, because, you know, as soon as you take an interest in people, their diabetes improves anyway, whether you do anything or not. If you're interested in their diabetes, they become more interested in their diabetes, quite reasonably, and things improve. So, one had to set this up in a reasonably scientific sort of way. And there was a long delay, and then we discovered that that was because the National Institutes of Health were considering their own big study, which turned out to be the Diabetes Control and Complications Trial, DCCT, which has been a real landmark in diabetes care. And I was fortunate enough to be asked... actually I was invited to run that, but for various reasons decided I wasn't going to up-tracks and move to the United States at that time, and was on the ethical committee of that study for ten years, and fascinating it was. But, it did demonstrate that, finally, RD Lawrence and

EP Joslin had been absolutely right, that, if you do control diabetes tightly, you will greatly reduce the risk of the development of... certainly the eye, the kidney and the nerve complications. At last, something that we always suspected, we now knew for sure. And that was terribly important. And it was because of the efforts of a whole lot of patients, who saw the importance of asking and answering this question, that we got the answers.

- (23) I think we were under the illusion that getting good control might solve all of the problems of the person with diabetes. Of course, it doesn't, sadly - it creates problems, in some respects. They have to be... show almost 'metabolic introspection', as it's been called by some. But people do that pretty well, and they can, with discussion, come to accept the fact that they're doing themselves a lot more good than harm. The other thing that really surprised us - and it shows how there's a 'law of unintended consequences' in all of these things - I personally expected to be able, as the blood glucose came down to normal, to look into the patient's eyes with retinopathy, and just see the retinopathy dissolve, disappear - as the fire was put out, as it were. But, in fact, the reverse happened. In the people who were really tightly controlled, the eyes actually got worse, and for a few months one saw a rapid acceleration of the retinopathy. Fortunately not to a level where it started to affect vision, but certainly a substantial increase in pace of retinopathy. And it was only because we went on and looked at a number of our patients over the course of a longer period of time - for two years, in fact - that we were able to show that, after that first flare-up, it would settle down. And, after that, the people on tight control got a much, much slower rate of development. But that was very alarming. And, in fact, had we not done our first studies, I think DCCT might have come to a sticky end after its first year, because, at the end of the first year, what we saw was this worsening of retinopathy. And also the fact that people who were on tight control were getting three times as much hypoglycaemia - so what were we doing to these people? And it was only because we could say "yeah, but go on. In a year's time it's gonna look quite different" - and it did. And at nine years it was stopped a year early, because it was so obvious that people under tight control were doing better - that one was able to sort that extraordinarily unforeseen thing out. Of course, it raised the question of people with Type 2 diabetes. This was, you know, had now been demonstrated for Type 1 diabetes, but Type 2 diabetes, the situation was much cloudier. And it, in a way, had been made very difficult by a study, which had been done in the 1960s, and which came to publication in the very early 1970s,
- (24) • the UGDP study: University Group Diabetes Program study - which, to people of my generation, will strike a chord. I was going to say "strike horror in their hearts", and almost that. Because, in this apparently well-conducted American study in twelve University centres, it was apparently shown that people being treated with the oral anti-diabetic drugs, then available, were two to two-and-a-

half times as likely to die a cardiovascular death as people treated with placebo. Not only were we not helping diabetic patients with tolbutamide and phenformin, as it was then, we were actually seen to be slaying them, and that was awful. And you can just imagine what the reaction of the general public was, what the reaction of the medical profession was. It was sharply divided. The results of that study were leaked to the Wall Street Journal before they were actually announced to the public. And Upjohn, who made this drug that was apparently killing people, had a catastrophic fall in their share value because of it. It was awful bit of bad publicity, and bad release of information. But, worst of all, it filled people's minds with uncertainty about how to treat Type 2 diabetes: whether these tablets, which had seemed really very good to bring down blood glucose, were having this really unforeseen action. Fortunately, we in Bedford, in our Bedford study, had been doing a control trial with the same drug. And we were able to show that in our Bedford group, in fact, we had actually reduced the risk of vascular disease - actually, a whole bundle of vascular diseases, not just heart disease - but certainly not a shred of evidence that we had increased risk. And there were one or two other minor studies. But we were putting up our little Bedford study against this gargantuan, US, vast thing, which had cost the great sum of, I think, seven million dollars, which at that time was unspeakable amounts of money - so how could we be right? But this argument... bitter argument, as it was in the United States, certainly came over to Europe, and there was great and violent dissension about the use of oral agents - which almost lasted to this day, but which was finally brought to a halt by UKPDS. I have to express my enormous respect for those who started the

- (25) UKPDS, in that sort of environment. Rob Turner and I discussed it at some length. Here were assertions that these drugs were actually liable to kill people, and were being tested again in a large-scale study. Fortunately, as I say, with countervailing evidence that they didn't; and, as history now tells us, they don't. It is quite clear that what was happening in the UGDP - the American study of the 1960s and seventies - was either related just to the drugs they were using, or much more likely, to my mind - and looking at the evidence again - much more likely to be a way in which the statistics were interpreted. I can't go into it in detail, but it's really very dubious that those results really represented what was happening. So, Type 2 diabetes now really came much more sharply into focus, as it has done over the last twenty, twenty-five years. And what became quite evident was that here, just as in Type 1 diabetes, the patient's cooperation was absolutely essential. There were dietary things that the patient needed to take account of. I mean, one of the things that people with Type 2 diabetes were most worried about, when they were told they had diabetes, was what this was going to do to their dietary life - their nutritional life.

“Am I going to have to eat awful things, and go onto terrible diets?”. And it was certainly possible to tell them they wouldn’t have to do that, but there were also some rather embarrassing changes that most of us had to make in the advice we were giving to our Type 2 diabetic patients. In the 1960s and seventies, we were telling them that, if they got hungry - many of them were overweight... were on reduced caloric intake, on reduced food intake, really to try and help them lose weight and improve their diabetic control. But one of the things that we told them was that, if they really got hungry, they could eat a chunk of cheese, or have a couple of eggs, or some... a bit more butter on their bread, and so on. And, by this time, it became clear that that, probably, was not good advice - either for people with diabetes or for people without; that this might have been one of the things that was producing this great rise in coronary heart disease that one saw in the country. And that really emphasised one of the things that I’d learned in one of my overseas trips. I’d been invited to Japan, in the middle 1970s,

- (26) to talk about our findings in the Bedford Survey. And what I did was to talk about this link that we’d found between diabetes and increased risk of heart disease, and people with lesser degrees of diabetes, but still with an increased risk. And at the end of the talks that I gave, I was rather struck by the fact there wasn’t much in the way of discussion. And my host was with me, and I said to him “Eishi, are Japanese audiences very polite, or perhaps I’m boring them stiff?”. And he said “well, no. As a matter of fact, we don’t see any - or don’t see very much - heart disease with our diabetes, here in Japan”. So, I said “you mean coronary heart disease and gangrene?”, “No, very little”. He, this Japanese - Eishi Miki - doctor had spent some time in the United States, where he’d said he was absolutely dumbfounded by the amount of heart disease and gangrene that he saw at the Joslin clinic, where he’d worked. But he just didn’t see it in Japan. So, I asked the question: “why not?. I mean, why are the Japanese apparently exempt - saved - from this consequence of diabetes?”. And it became clear that it had something to do with the Japanese way of life. If Japanese people moved to the west coast of the United States, and started living an American life - and eating an American diet, probably, was the cause - their risk of coronary heart disease went way, way up, and really quite quickly. So that that sort of evidence, and other experimental evidence, suggested that one could help to protect people against coronary heart disease by changing their dietary intake of fats, and, in particular, the sort of fats that we’d been rather recommending to our diabetic patients that they fill up on: dairy fats. And the things that were helpful were the high fibre foods, the unrefined foods, and oils - seed oils - which were helpful in bringing down the cholesterol in the blood, and so protecting the arteries. So, we had to go through a sort of hundred-and-eighty degree turn in the advice that we were giving to our diabetic patients, saying, you know, “forget all that stuff we were telling you last year about filling up on this

and that. Now, eat plenty of starchy foods, so long as it's unrefined, and make sure you get adequate fibre in your diet, and cut down particularly on dairy fats".

And you can actually remember, can you, giving this change of advice to patients? How did they react?

Oh yes. Well, I don't think they took much notice of the dietary advice in the first place, so the reaction was sort of muted. In fact, we did a study, with one of my

- (27) nutritionist colleagues, on what diet people with diabetes actually ate, and we compared it with the rest of the family. And we found that they were eating virtually exactly the same foods as the rest of the family, except that they had more or less cut sugar out of their diet. That was about the only significant difference we were able to show. And, in fact, of course, the advice now given to people with diabetes is exactly the same advice as is given to the general population. And it's twice as important for the person with diabetes, because we know that for the same level of cholesterol in the blood, the person with diabetes is going to get twice as much coronary heart disease as the person without diabetes. And it follows that, for the same reduction in cholesterol in the blood, the person with diabetes is going to benefit twice as much as the person without diabetes. So, one's able to go into this new approach to dietary information with a lot more confidence and optimism. One can actually hope to be conferring some protection - to have some evidence that one can do that.

You mentioned that, in earlier decades, it was you, RD Lawrence, and physicians who were giving the dietetic advice. By the 1970s, were you passing them over to a dietitian, or not?

I personally wasn't, though, of course, I worked with our dietitians. And the patients themselves sometimes wanted to see a dietitian. Of course, when they did, and it was possible, they were... they had interviews and discussions. But a lot of the dietary information, which is really pretty important for people with diabetes, has to be part of the general conversation between the patient and the doctor, and the doctor has to have a pretty broad notion of the sort of useful nutritional advice to give the patient. But, as I say, for most doctors, this now should not be a difficulty, because it's the same sort of advice that they, hopefully, give to the general population.

- (28) But the Japanese had clearly been eating quite differently all along. What came out of that Japan story?

Well, the first thing I thought we needed to do was to confirm the fact that there was a real difference between coronary disease - vascular disease, generally, arterial disease, generally - in people with diabetes in Japan and in Britain. So I suggested to my Japanese host that we did a comparative study: that we used exactly the same methods, and that he in Tokyo, and I in London, would examine

a group of people with diabetes - decided on about five-hundred people, chosen in a rather careful way so that they were representative - and we compared them. And I came back to Europe and discussed it with our little epidemiology group - the one that had started in the 1960s, and which was now meeting every year and talking about these sort of problems - and there was enormous interest. And several European... my European colleagues wanted to join in, and some transatlantic ones did. And finally, we had twelve centres, which joined together to form, ultimately, what we called the 'WHO multinational study of vascular disease in diabetes'. The WHO study, because we managed to convince the WHO that they should be at the heart of this - that it was something that affected people, the health of people, the world over - the diabetic population - which might even reflect on people without diabetes, as well.

What was the date of this?

This must have been about 1974-75. In fact, it was. It was the early seventies, and we had our first meeting of multinational investigators in the year of the four day week, which I think was 1974. We met at the CIBA Foundation, and we had a four day training course, when representatives from each of the twelve centres from all over the world came, and, by the courtesy and generosity of the CIBA Foundation, were able to stay at the Foundation. And we developed our methods, and agreed that we would stick absolutely rigorously to the same methods, so that our results would be comparable. And WHO really gave us their sort of aegis. They didn't give us very much in the way of money, but they gave us accommodation, they gave us a lot of support, and that was very helpful. And that study went on for... in fact, the last follow-up paper was published just four years ago, in the year 2002. So, it had lasted for jolly nearly thirty years, but part of that was because of the delay in getting the writing-up done. But the follow-up study itself was over the course of about fifteen to eighteen years. And we did the first comparative study - a sort of snap-shot of the amount of vascular disease in each of these populations - and found that in fact it was absolutely right: the Japanese had remarkably little in their sample, the British had moderate amounts, and some of the European centres were really quite badly off.

(29) So moving on, then, from the 1970s into the 1980s. What happened next?

Well, I suppose the continuation of the multinational study is really quite an important vehicle for what happened, because it was quite clear that to deal with some of the complications of diabetes, there were things that could be done that just were not being done. Apart from the clear effect of improved control of diabetes, it was... it had become evident that - for example, screening for early eye disease, followed, where necessary, by early laser treatment of the eye; screening for early kidney disease, followed by the use of certain blood-pressure lowering preparations; and, in particular, care of the foot - could prevent eye disease, blindness; could prevent renal failure, or certainly delay it; and could save legs and feet. And these things had all been demonstrated in clinical studies from various parts of the world. Some of them from Britain, a lot from the

United States, but from Europe, generally, and elsewhere. But these things were often limited to centres, and it was quite clear that they had to be extended out to the whole diabetic population. And the question was: how best could this be done? Well, the WHO had really been sort of invaded by us, with our vascular multinational study. And, probably as a result of the nuisance we'd made of ourselves to them, I was invited to chair an expert committee on diabetes, which I did in 1979. And that, I would be modest enough to think, was a sort of turning point in the official attitude to diabetes. We made it very clear, first of all, that the Lawrence dictum, that every diabetic patient should be their own doctor, was one that was really true, and that the patient was a collaborator in the treatment of diabetes, rather than a victim. And this sort of education, in its broadest sense, which is explanation and motivation as well, was a terribly important part of what the medical attendant could do for the person with diabetes. That, I hope, shows through in that expert committee report. It also became clear that the problem of... that dealing with the problem of diabetes obviously differed very much from society to society. In the technically advanced societies, there were things that were possible, that weren't possible in those developing countries that really had very little access to resources or to technology, and so on. So, we had to try and find some sort of formula which was appropriate to...

- (30) sort of universally, in a way, but which could be applied locally. Think globally, work locally. And, to an extent, we were able to do that, though, of course, that's an enormous problem. One of the ways, in which we proposed, was that each locality - each region - of WHO should develop its own plan of dealing with diabetes. And it was the European development of that idea that gave rise to the St. Vincent Declaration at the end of the 1970s. There's a sort of rule of ten years, I think, that it takes ten years for an idea like that to actually be given substance. I don't know whether it's just diabetic ideas. I don't think so, I think it's a rather general notion. But by the end of the 1970s, about 1979, the European region of the International Diabetes Federation had met up with the European region of WHO, and together they had put together this plan - which I had the privilege to be very much involved in - of getting together all of the health departments from every European state, and putting to them the problems that confronted the diabetic population, and the solutions that were available, if the decision was made to get on with it. You know, one of the slogans, in a sense, was that really the effective treatment of diabetes is largely a question of doing simple things well. We met. That was a meeting that was addressed more by people with diabetes than by healthcare professionals, which partly gave it its strength. And the other thing that gave it its strength was the fact that a lot of members of health departments - bureaucrats, if you like - met with a lot of people with diabetes. And, in between sessions, it was very interesting to see them sitting down talking about what actually happened, what life was like for people with diabetes. And that gave that particular meeting a great

energy. And out of it came the one-page St. Vincent Declaration, which set out some really rather well defined aims and goals, which still drive people on, and - in Britain, at any rate, at the moment - have sort of finally been transformed into the Diabetes National Service Framework that is improving the care of diabetes across the country.

- (31) So, that's still the 1970s - 1979. Can we talk about how that changed clinical experience during the 1980s?

It was, I think, the sort of hinge-point, when it was accepted that Type 2 diabetes was a real problem that we had to get organised about, and that there were a lot of measures that could be taken that weren't being taken. For example, eye screening: it was quite clear that if you screen the eyes and picked up changes at an early stage, and treated them, you could stop people going blind. And, I have to say, I was driven to exasperation, on occasions, when people started putting up cost-benefit arguments. How on earth one could argue that there were cost arguments against stopping somebody from going blind, I just couldn't see. But these notions were then accepted, but only by dint of arguing them in each of the European countries. And there are some countries which are way ahead of others - still, to this day - in their eye screening, and in the services that they have for dealing with the people who are found to be at risk. But the same also goes for kidney disease and gangrene of the foot, and various other aspects of the diabetes complications. There is now, clearly recognised, a whole series of early measures - early indicators - of risk status for the individual, which you can take action over, and substantially reduce the risk of the development of the sort of end-stage disease.

And were all these screening measures spreading all over the country during the 1980s?

Yes. This, of course, was also the era when this sort of question of the role of primary care, in relation to diabetes management, arose. It was becoming pretty clear that there just were not enough diabetes specialist doctors and nurses, and so on, to deal with this vast new clinical challenge of people with Type 2 diabetes that was... I mean, in many ways, we were reaping the benefits of people living longer, people feeling better, people having cars to drive around in. All of the things we were so desirous of having, unfortunately, were increasing the risk of diabetes. And there had to be something that we did about that, and certainly something we did about reducing the risk of the complications. So that it looked as if the, really, the cavalry had to ride to the rescue, and the

- (32) cavalry here was primary care. Interestingly, in the... way back into the 1940s and the 1950s, general practitioners had not really been particularly interested in diabetes. In fact, they'd been scared by it, because, in those days, most of the people with diabetes were on insulin, and insulin was pretty fierce medicine. And unless you knew how to handle it, you were always frightened, as a non-specialist, of plunging somebody into deep hypoglycaemia, or letting him or her run into diabetic coma. And people



were - not only the patients - but the doctors were scared of this disease and of its treatment. So, they were only too happy to hand over their patients to the diabetic clinic, and the diabetic clinic, of course, was only too pleased to take them on, and to do its best for them. But, the situation changed. The GP found increasing numbers of Type 2 diabetics on their... amongst their clientele, and, since it was habitual, they referred them to the diabetic clinic. And, on the whole, GPs in those earlier years, right up to the 1980s, in fact, were saying "no, diabetes goes to the hospital. We don't look after diabetics, the diabetic clinic does". And that was clearly unsatisfactory, and wasn't really going to work in this new era. And so the question, really quite dramatically, posed itself: "how can primary care and the specialist services work best together in the interests of people with diabetes?" That is, after all, what it's all about. I mean, it's a patient-centred system, or should be. Unfortunately, government didn't see it in quite that light. Although they agreed that GPs might look after more people with diabetes, I think they did it for less noble reasons. I think, probably, they thought it would save money. They were wrong. But there was a sort of wholesale movement of patients out into primary care, without any sort of preparation. And I think that was very sad. Primary care doctors never really sat down with their specialist colleagues and said "how can we do the best job here for the diabetic patients, so that they get the best out of both systems?". That, I think, is still needing resolution; that sort of problem is still needing resolution. There is still uncertainty about the relationship between primary care facilities for people with diabetes, but there is no doubt that the opening of primary care to people with Type 2 diabetes, in particular, has greatly improved the prospect of bringing useful measures of prevention and management to them. And I, myself, have spent, over the last few years, been spending some time in our local general practice seeing people with diabetes. And it's quite clear that an awful lot of useful work can be done in primary care, that was very difficult to do in some of the crowded diabetic clinics. It does leave unresolved what the role of the Diabetes Centre is. And, in my view, the Diabetes Centre ought to be the hub of diabetes activities in a locality; that GPs ought to regard the Diabetes Centre as part of their own property, as it were, and to use the skills and expertise, and have a real say in the way it runs. And so ought the patients too. But that's yet to come, and hopefully we'll see that developing over the next few years, if people have any sense.

(33) And before we move on to the 1990s, any more memories from the 1980s?

Well, I suppose a couple of the big events - for me, at any rate, and also to people with diabetes, of the 1980s - was the appearance... one of them was the appearance of human insulin. This was, you know, the real flowering of technological development, and meant that, instead of having to laboriously collect pancreas from animals all over the countryside and extract insulin from them, one could programme - genetically programme - bacteria to make insulin

themselves. And it really was a... well, a first example of this new biosynthetic technology. But, it wasn't an unalloyed success. Unfortunately, a number of people found that when they changed over to the human insulin, they were more liable to develop hypoglycaemia, and they came to the conclusion that it was the change to the human insulin which was responsible for that. Some of them were put back on to animal insulin, on to pork insulin or beef insulin, and apparently got less hypoglycaemia. And a lot of studies and a lot of anxiety, of course, grew up amongst the diabetic population about the use of human insulin. And, in fact, there is a small group of people who have sort of clubbed together and formed their own foundation to preserve the use of animal insulin; so sure, are they, that it's not been an advantage to them, and it may be so. But, for the vast majority of people, the appearance of human insulin has made a great deal of difference. And, of course, now we're into even a further era, where we can modify the structure of the insulin to get it to do things - to act faster or to act for longer - that native human insulin... we're improving on... trying to improve on nature, and, I think to some extent, succeeding. But we obviously... one has to be very careful about any of these developments, and to be sure that they are for the advantage of the patient. But one of the... I think one of the advantages that this biosynthetic technology has, this new technology has given us, is that we can start to modify the molecule for people with diabetes, so that it has the sort of effects we're after. And there's no doubt that delayed-effect insulin is providing a better background control for their diabetes, and the rapidly-acting insulin gives them a chance to take their insulin more closer to their meals.

- (34) The other big - and, I suppose, really rather characteristically British - thing that happened was the changeover in the strength of insulin. At the beginning of the 1970s, most people were still using U40 or U80 insulin - forty units per cc or eighty units per cc insulin - using a syringe which had been developed for U20 - twenty units per cc - syringe. So, in order to decide what dose of insulin you were having, you had to multiply up by two or by four. Now, the patients knew this perfectly well; they became experts in this abstruse calculation. The people who didn't understand it quite so well were the doctors and the nurses. And when patients used to go into hospital, sadly, occasionally, rather dreadful mistakes were made, because the double the dose, or even four times the dose, or half the dose and a quarter of the dose, was given, because the calculation was done the wrong way round. The patient would say "no, no, I don't take that much insulin", and the dear nurse would say "oh, yes you do", and in it would go. And there were enough adverse effects from this for us to be able to put a paper together into the British Medical Journal, to show that there were real risks, and that there would be real advantages in switching to a single strength of insulin, U100 - which is, of course, now what's used - with a single syringe designed for the U100 insulin. And so we undertook this great task of changing over the couple of hundred thousand people in the UK from the old insulins to the new insulins. And it was a great organisational task,

which was undertaken nobly by the British Diabetic Association and by the Department of Health, who really set to and organised this alongside us. And it went very well, but it was the occasion, interestingly, for a general review of the sort of insulin that people with diabetes were taking. We discovered that an awful lot of people were taking not the dose they thought they were, but either half or four times the dose. And we were able to put that right, and also to get the technique of insulin injection right as well, so that... It also brought together people in localities, so that the organisational side of things formed up groups of diabetes healthcare professionals, who continued to meet. Those organisations never really died out afterwards, so it had all sorts of valuable effects.

- (35) But it did mean that people changed over. As you might suppose, there were a number of people who felt the change to this new strength really increased their risk of developing problems with their diabetes, but fortunately that has all been now smoothed away, and the changeover is complete.

And that was happening all through the 1980s, was it?

That happened over the course of a very short period of time in the 1980s, yes. And human insulin was sort of coming in to use. Actually, the changeover might have been right at the end of the 1970s, and really taking hold in the 1980s. I must say, having the Diabetes Centres in existence - so that must have been middle 1980s - made an enormous difference to that changeover, and also gave the centres themselves a new *raison d'être*: brought all the diabetics in the locality in.

Several of the patients I've interviewed, who are on the website, were absolutely convinced that the change to human insulin was a negative experience, when they lost all their warnings of hypos. And they simply couldn't convince the medical profession that that was so. What are your comments on that?

Well, the patient's experience is what counts, and if the patient thinks that it's the change of insulin which is threatening them, then they should be encouraged to change back. A lot of studies have been done, and they're pretty conclusive. The best organised studies, from a scientific point of view, do suggest that people are not really terribly well able to distinguish whether they're receiving human insulin or animal insulin. But there are people who are absolutely insistent that they can, even though, to some extent, it's been demonstrated that they haven't been able to. And if people feel that, then, if it's possible to cater for their feelings, so one should. If it is a problem, it's a problem of hopefully a very small number of people. And the vast majority of people who go onto human insulin appear to have no trouble at all. It's entirely understandable that people who know that their lives depend on this absolutely crucial injection should be utterly confident about it and have no doubts about it. And, in fact, you know, how intensely people do feel about it was shown many, many years ago, in an event I remember quite well, when the - we used to make insulin in Britain - the British insulin manufacturers lost a lot of their insulin vials, and so they

had to use some Danish vials to put British insulin into. And Danish vials were a different shape, and they put the British insulin in. And there were many patients who thought that this new insulin was responsible for their increased risk of hypos. The insulin, of course, was unchanged; it was just the change of the vials. If you change the colour of a capsule or a tablet, people perfectly reasonably say “this isn’t the right thing, there is something wrong with this”. They’re suspicious of it, and particularly so when life depends on this hormone. Entirely understandable, and if one can relieve people’s feelings, in this respect, one obviously should.

(36) Is it time, now, to move on into the 1990s?

Yes, indeed. For me, the 1990s were very much conditioned by what was happening in the last years of the 1980s, and that was the so-called healthcare NHS reforms. I, personally, was involved at Guy’s when we took on a sort of new approach to running the hospital called the Resource Management Initiative, in which the staff themselves took over the running of the hospital. And were enormously assisted, of course, by the managerial and administrative staff, but it was the professionals - the healthcare professionals - who actually made the policies and ran the show, by breaking the hospital down, actually, into little almost sub-hospitals: the medical hospital, the surgical hospital, an obstetric hospital, and so on. Towards the end of that period, it became clear that it was a deeply laid plot - or so it seemed to the more paranoid amongst us - that we were sort of being used as a experimental area for this new regime, of an NHS which was based on a sort of market - internal market - principle, in which services were bought and sold. And not quite the sort of medicine that we wanted to practice was going to come. And so, a number of us became really quite concerned with this, and so, it has to be said, did our general practitioner colleagues. The BMA objected quite strongly. And we came to the conclusion that Guy’s was actually being modelled into this new sort of regime, which had got no parliamentary sanction at all. No Acts had been... no discussions, no legislation had come through parliament, and yet here we were being used as a model. So, we had the temerity to take the government to the High Court, and to challenge its decisions as an act ultra vires; that they were actually beyond their powers; that they were doing things that they had no legislative right to do. And this was, of course, also backed up by the BMA. And the BMA, at that time, were also running a campaign. You may recall the advertisements of the period

(37) on the hoardings, “What do you call the man who doesn’t listen to his doctor?”; Answer: “Kenneth Clarke”. Kenneth Clarke, of course, at the time, was the Secretary of State for Health, who was the main agent pushing these new market reforms. Well, to cut a long story short, we had our day - two days, actually - in court, where the presiding judge concluded that the government was actually within its powers, and made the remark that the powers that they’d drawn in the 1946 Act were so broad that they could do almost anything they liked. He didn’t know why

they were considering new legislation, anyway. But that was a sort of aside from Lord Woolf, who took us through that particular procedure. But it did... that was the launch of an organisation, the NHS Support Federation, which has subsequently maintained a campaign for a National Health Service based on public service rather than on private profit. Its most recent manifestation is in the campaign to Keep our NHS Public, KONP, which is on the web and on the hoardings. As for me, apart from that sort of political exit, because I retired in 1990 - on a high note, I don't know; on some sort of political note at any rate - to Emeritus status, which meant that I was still working at the hospital, still doing some research, still privileged to play a part in some of the clinical decision making, and so on. But, as the nineties wore on, I developed an interest in helping out my son, who's a general practitioner in Watford, where there is, of course, a very large South Asian population. About 30% of the population are South Asian. And we had shown, many years before, in a study that Hugh Mather and I had done in Southall in West London, that diabetes was two to three times more common in people of South Asian origin as it was in, what you might call, the local Southallians; the Europids. And in Watford, that is no exception. The risk of diabetes amongst South Asian people is moderately, mysteriously - and we still don't entirely know why - two to three times greater than it is amongst the European population. So, I have the great pleasure - and it is a pleasure - of seeing -

- (38) in a rather leisurely way, because I'm not under the sort of pressures I was as a busy clinician - people with diabetes at my son's, or the group's, practice. There are about four hundred and fifty, five hundred people with diabetes. And so, I'm slowly, now, working my way through them, for the second time, looking at them, reviewing their state, helping where I can. Of course, being an ancient doctor, I'm not entitled to make clinical decisions, and I certainly don't do that, but what I do is perhaps to make the occasional clinical recommendation, which the general practitioner who's actually responsible for that patient can pay attention to, or not, as they wish. But, it does give me a chance to talk to the patients at length. Most of them, of course, are Type 2... people with Type 2 diabetes, but an increasing number of them are on insulin, of course, and there are some Type 1 patients too. And it's really very interesting to see people with diabetes on this side of the counter, as it were; close to their homes, in a sort of environment in which they're clearly more comfortable than they are in the ghastly hospitals that they sometimes have to tread, you know, with all the smells and the sights and the sounds of hospital, which must be terrifying for an awful lot of people. In the GP's surgery, which they're familiar with, they're much more at home, and it's quite clear that an awful lot of useful work can be done there. I firmly believe it could be even further improved by better links between the local specialist centre and the primary care centre. But, you know, the great advantage in this is the role of the nurses. The nurses are, as ever, very close to the patients - in a

way closer to the patients than the doctors. I mean, these are very good GPs that I'm working with, but even the best GPs can't get as close as the nurses. And the nurses can deal with each other too. The nurse will talk to the nurse in the hospital - the specialist nurse in the hospital - without any sense of loss of status, or whatever. Nurses, unlike doctors, don't want to be famous or earn vast sums of money or go to international meetings. Their absolute first concern is the patient, and that's the way it should be.

You mentioned a nurse in RD Lawrence's clinic, to whom all the patients poured out their troubles. Was she, in any sense, a diabetes specialist nurse, or not?

Oh, yes - she had invented herself as a diabetes specialist nurse. I don't think she had any special knowledge or feeling for diabetes when she joined. I'm ashamed to say I can't remember her name, but she was a wonderful woman. And I learnt an awful lot from her, and particularly her appreciation of the sort of emotional problems of people with diabetes. And, of course, that was a Type 1 clinic, really, in those days, and these were people all on insulin, all terrified of hypoglycaemia, all wondering what the future was going to bring, all aware of those awful feet or half vision and white sticks, and so on, in the clinic. And she recognised the sort of emotional problems that they were going to have to face, and helped them to do so. And helped a lot of us junior doctors to understand as well.

(39) And now, in your son's clinic... in your son's GP surgery, with mainly Type 2 patients, how do they respond to having diabetes?

Well, very variably, of course. I mean, Type 2 diabetes is something that isn't terribly visible, necessarily, and it's really rather too easy to convince yourself that it's really no problem; that you don't have to bother too much about it. On the other hand, you don't want people to be utterly preoccupied by their diabetes. It's a question of trying to find the happy medium. Not an easy task, and, of course, a very, very different thing for different people. But it does mean spending time talking: creating a little bit of anxiety in those who have none; appeasing too much anxiety in those who are over anxious. So, there's no clear answer to this one. What is absolutely certain is that the emotional response - the acceptance or not of the diabetes - is absolutely crucial for everybody. As I always say, "You've become a member of a club nobody wanted to join. Make the best of it".

And then, just one footnote to the recording.

Really about my research. Most of it was clinical and involved people with diabetes, rather than animals and so on, and it was assisted by a whole lot of funding agencies: Medical Research Council, Guy's, and a lot of support from the British Diabetic Association. But also - strangely, you may think - some support... quite a lot of support from McDonald's hamburgers; actually from the Croc Foundation. The Croc brothers were responsible for developing... actually, they were the founders of the McDonald hamburger empire. And in their family they had diabetes and multiple sclerosis, and one or two other

conditions, and they rather generously funded those disorders, and they helped us in some of our research. But, what they did was to run meetings in their ranch in San Antonio - right next to Ron Reagan's ranch, actually. And there was a diabetes meeting... there were several diabetes meetings there that I attended - thirty or forty of us - and we discussed various of our studies. But the one that strikes my memory most of all was the WHO multinational study results, which we gave for the very first time, and unveiled quite a lot of our first thoughts about vascular disease and diabetes.