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**Dr Denis Burkitt, CMG FRS in interview with Max Blythe  
Bisley, Gloucestershire, 29 October 1991 MSVA 064**

**Interview IV**

MB Denis, early in 1966 you started virtually a new career. You were out of Uganda, you arrived at MRC in London, to take a desk near to Tottenham Court Road.

DB Yes. It wasn't so much a new career as... my career was to come to start a year later. But I was very fortunate in that when Uganda got independence it was quite obvious that before long they wouldn't want the added expense of getting somebody like me from overseas and that people that we had trained would be able to take over the job, and so I handed over my surgical work in Uganda in '64. And through the very good services of my colleague and friend Sir Ian McAdam, Sir Harold Himsworth, the director of Medical Research Council was interested in the work I had been doing on cancer and he took me on and gave me, as it were, a free hand. He gave me a few rooms, I had a secretary and a typist and he said, 'Just get on with it.' And to be given a job to do and not told what to do and not even asked what you are doing, is just ideal for research. I was able to do things that were in my mind and I started off extending what I had been doing for the previous two years in Uganda, getting information from about one hundred and fifty hospitals every month and plotting these things. Now, what we had really done, together with Michael Hutt, who became professor of geographical medicine later at [St] Thomas' Hospital: in the past cancer had always been ...any disease was looked upon, Nigeria got, Uganda got, Biafra got, and so on. Now, we were getting diseases by every hospital, totally irrespective of political boundaries, and disease doesn't observe political boundaries. So we were trying to map disease on a much smaller scale than just comparing country with country, and this of course had worked extraordinarily well in the [Burkitt's] lymphoma and then we had extended it on to a whole lot more tumours. So that is what I built up when I got to Tottenham Court Road.

MB So in effect you became a full time epidemiologist without taking the responsibilities.

DB Absolutely... marvellous.

MB What was the culture shock like though landing up in Tottenham Court Road?

DB Oh well, it would have been worse if it wasn't for the fact that for the first three or four years I went back to Africa twice a year for quite extended safaris, because my work was built on getting people to co-operate and send me data, and you can only build this up if you visit people and get to know them. Well, I have to look back a little bit now. When I first went to Africa I was disappointed that with a Fellowship [of the Royal College of Surgeons] and a MD and one of the only two qualified surgeons in the country, I was disappointed I was sent to look after a district

or bush hospital. I felt I should have gone straight to the centre, but subsequently this was always an advantage, because when I visited people running district hospitals they knew I had stood in their shoes and I understood their problems, because if I had come out there like a famous statistician from Oxford or somewhere they wouldn't have listened, it would have been a different language. So it was a good thing that I started my life in a bush hospital because then when I got interested in epidemiology I was able to make contact with people working all over Africa in bush hospitals.

MB Denis, there came a time though when the whole of this process of travelling and collecting an enormous amount of data on cancer - you went everywhere - but there came a point in that run of studies where you had an unusual meeting - a totally unexpected meeting.

DB Yes, a totally new experience which changed the whole course of my life. I think it was in 1967, the year after I came back from Uganda. Richard Doll - he wasn't Sir Richard then - but he had an office about two blocks away from me and he rang me up one morning and he said, 'Denis I have a fellow in my office who I think would be of interest to you. He has written a book about work which I could tear to bits as a statistician, but I have a hunch the guy might be right and I think you ought to talk to him. Would you like to see him?' I said 'Fine'. So he sent round to me a retired naval physician; everyone called him Peter Cleave, he was Captain T L Cleave. And he was full of ideas and he sat down and told me about his ideas. He had been looked upon as a bit of a crank by the profession as a whole, but he was absolutely convinced. And what he showed me was - and this was absolutely eye-opening to me - that many of the commonest diseases affecting populations in the more industrialised countries of the world were peculiar to modern western culture, didn't occur amongst primitive people and were equally common in black and white Americans. So that was immediately saying two things: that many of our commonest diseases, being peculiar to our country, must be somehow due to our lifestyle and are preventable, and if they are as common in black Americans as white Americans... well, they must be preventable and yet we spend all our time as doctors - and I was doing this - treating them instead of preventing it. Now, I was possibly... I swallowed Cleave hook, line and sinker and there were lots of things he was not right in, but a lot of things he was. I swallowed it all to begin with and I was frightfully excited. And I might have been the only person alive at that particular juncture who could, as it were, test Cleave's hypothesis, because Cleave had never worked overseas himself. He had been overseas in the navy on a ship, but he never was in an overseas situation. But he had a voluminous correspondence, all over the world, all done in long hand with his own hand, collecting information. But I had at that time built up a sort of network of hospitals, rural hospitals, mostly mission hospitals, because that is where you had the dedicated people spending a long time, and about a hundred and fifty hospitals were reporting back to me every month on cancer. Now, when I was challenged with the idea of, are these people seeing, diabetes, gallstones, diverticular disease, hiatus hernia, bowel cancers and so on, I immediately had a network which I could plug into and I straight away got to write them out and summarise it, what I had learnt from Cleave. I read all his books avidly, straight away and I made a sort of summary and I sent it all over to the Third World. And I said, 'How often do you see these diseases?' And of course I knew from my own experience that they were rare in the Third World. And later on I was even able to expand that because I had a friend in America who ran

one of the biggest giving aid organisations in the world, called the Medical Assistance Programme. They were getting drugs for nothing because they realised that if you clink into a drug company, if they make too much stuff - which they have got to do - the stuff that isn't used is wasted, a dead loss, but if they can give it away to a charitable organisation, then they can get tax back on it.

MB Right. Now this is Ray Knighton, whom you have already mentioned.

DB And so they were sending drugs to mission hospitals all over the world. I hit on the idea, supposing they, when sending out millions of dollars worth of drugs, send a little questionnaire round to the chap and say could you spend five minutes just filling in this form and tell him whether he has received these things. Well, if you are going to get a thousand dollars worth of free drugs you sit down and you fill it up, but if you are getting nothing, you throw it away. So I managed to get information from many hundreds of hospitals over the Third World and all the way round the answers were the same. Now, you see Cleave would have been criticised for presenting anecdotal evidence, because it was anecdotal, he had collected it. But if he had anecdotal multiplied by a thousand and it had stayed consistent, then people listened. Now, two things happened which weren't really fair and I don't deserve credit for them. Other people like Cleave had made this observation before, but they were written off as cranks. Now, just because there happened to be a Burkitt's lymphoma, when Burkitt said, 'What about looking at this,' people listened to me when they hadn't listened to far better guys.

MB You had got a platform already.

DB I already had the platform. So I found myself launching out, as it were, and as if God had opened to me a new door and I was going into something which I felt was far more important than any thing I had tackled before in the field of medicine. And I was excited as you could make me.

MB I mean you are looking back at this point, Denis, on to what was a great event. Was it really that great at the start? I mean do you remember it?

DB Oh, I thought it was great, I mean a lot of other people didn't. But I realised that it must be something of potentially enormous value. The fact that our commonest diseases didn't occur in people who lived a simple ordinary lifestyle. Why not?

MB You mentioned that Cleave had a hypothesis about modern living, modern standards of living related to diet. What was the actual... can you take me into that hypothesis, in some detail - how he thought when you first met him?

DB Well now, Cleave was totally right and wonderfully right in recognising that many diseases were characteristic of modern western culture. He was also totally right in identifying that they occurred commonly - he didn't know how commonly - but commonly in black people. But he was almost totally wrong in his initial conclusions. He began to think: what is it that is different to our lifestyle today to what was our lifestyle in the past, and what is our lifestyle to people in the Third World? And he came to the conclusion that the major problem was the consumption

of sugar, that we ate far more sugar than our ancestors did, far more sugar than Third World people did. Now, he did at the same time recognise the value of fibre in the diet, but sugar was the central point. And so he lumped all what we call 'western diseases' together, under the single name, the 'saccharine disease' - saccharine meaning related to sugar. Well, now sometime after this, after I had been working on this for some time and I met Hugh Trowell, which we can go back on in a moment. Both Hugh Trowell and I swung right away from sugar on to lack of fibre. We realised you couldn't have the refined diet unless you took the fibre out. Now, Cleave didn't like us making that change. We owed him everything, I still do, but this was a change we had to make as we looked at evidence around the world. And therefore we had to alter some of the mechanism which he postulated, which were ingenious at the time, but didn't turn out to be quite right. Because after all any geographical explorer who draws a map of a new country... Columbus thought he had gone to India, subsequently the explorers changed the map. That doesn't take anything from the original explorer. Now, we had to change the map in a way that Cleave had put, and put much less emphasis on sugar and much more emphasis on fibre.

MB Okay. So I have got that far into the story. You form a fairly good working relationship with Cleave, you think he has got ideas worth taking on.

DB Absolutely.

MB But later on it gets uncomfortable because you want to take it on and he feels that you are adding too many tails to the kite, or whatever it is. I am getting that impression.

DB Yes.

MB Before we move on can I just ask you two questions? One about Cleave, what kind of a personality was - I mean you owe him a lot - but what kind of a personality was this man?

DB Well, a great enthusiast, laughed at by most of his profession because they thought him a crank. And because he got thought of as a crank, it made him rather bitter and if anybody criticised his concepts he looked upon it as a criticism of his whole personality and he would immediately come back with a broadside in proper naval fashion. So that he had wonderful ideas, which he stuck to, but he wasn't easy to work with. He was a genius but he wasn't easy to work with because he was never prepared to be told he was wrong. I mean I had to be very careful. If I pointed things out to Cleave... I remember one occasion - it rather makes the point, I'll just mention it - I went to India and I travelled round India with Cleave's ideas in front of my mind, testing his ideas on peptic ulcers and one thing and another, and I came back and saw him again, as I was always glad to see him, and I said, 'Peter I am afraid you will have to alter your concepts of this because it doesn't fit in with this part of the world.' 'Oh he says don't bother, all it is (inaudible), and so you forget about it.' But you can't do that, you can't - and we have all done it, I have done it. There is a tendency when you get very keen on an idea if we find evidence against it to sweep it under the carpet. When you find it in a book, you turn over the page. I have done it, I think we all do it as scientists. Now, Cleave tended to do that and Denis Burkitt has tended to do that,

but I had to learn to not to do it, and it was Hugh Trowell who helped me very much. And Hugh Trowell would always contact me and say, 'Well Denis what I told you last week, I discovered is wrong.' You see, he was always looking for something to show he might be wrong, because every time you are wrong you are a step forward. But Cleave found it very difficult.

MB Did this prevent you, this approach that Cleave had, from getting close to the man, who you rather cared for?

DB I did care for him a lot and I never got very close to him. I went down and had lunch with him one time in his house, but I never got very close with him, but I had an enormous regard for him. I got much closer to Hugh Trowell. I was close with Hugh Trowell for nearly twenty years.

MB Right. I am just going to take you that way now. We have got the link now with Cleave, we have said a little about him and the kind of person you were working with and that his ideas had a lot to offer.

DB Tremendous.

MB And you started now, you have already mentioned the approach to mission hospitals and what you have got back was really reinforcing his basic hypothesis.

DB Exactly, exactly. But reinforcing the basic, enormous contribution he made, if I had been given the chance of putting somebody up for a Nobel Prize, I would have put Peter up. But there were several things that had to be amended and he wasn't happy about amending hypotheses.

MB Can you take me on to this. We could perhaps now take that as our step forward. You start to make your enquiries. Can you take me on through those enquires to the point at which you started to need to amend Cleave's thinking.

DB Well now I wrote round all my hospitals asking them whether they saw this that and the other, and then I also began at the same time following the work of Alec Walker, who had done a great deal of work on constipation and fibre.

MB He was in South Africa?

DB South Africa, Johannesburg.

MB Right.

DB And I began very early on, realising that one of the things we knew nothing about, and which was frightfully important, was how much stools people passed a day. No doctor had had any idea at all. And I got people in India, all throughout Africa, South America, to do tests to find out how much stool people in different tribes passed a day and how long it took the food to go through. And we had little plastic pellets made, impregnated with barium and we would give - I think it was twenty of these to a patient to swallow. It had been noted that he swallowed them at a certain time on

such and such a day and then over the next two or three days his stools would be collected and they would be x-rayed. Now, in England you see I had to carry them in from a local school in my briefcase and get them x-rayed in London. But we got hospitals all over Africa to do that and I found it... people thought it was daft. But my major research interest that came out of that was measuring stools. And we found that people in western countries, who have high rates of all these diseases which Cleave had mentioned, passed between eighty and hundred and twenty grams of stool a day, whereas in Africa and India and so on, they were passing three to five hundred grams of stool a day. And then we found it took three days for our diet to go through your gut in England; it went through in thirty six hours in Africa. Walker had been doing this for the last thirty years and he had enormous figures to draw on. So at the same time, or more or less, as I got interested in disease patterns and a bias towards diet, I got this interest in stools. We might in a moment come over to a famous Irishman who was before me. But I might say, you see, after I had got a certain amount of information together, I timed one of my East African safaris to fit in with the centenary of the birth of Sir Albert Cook, the famous missionary of Uganda. And Hugh Trowell had been Cook's physician, so the Ugandan government paid for him to go out for these special meetings. And I went out and I spoke at the meetings and I spoke on Cleave's ideas at this conference in Kampala. And it immediately struck a bell in Hugh Trowell's mind, who had written a book in 1960<sup>1</sup>, ten years earlier, - hardly anybody had read it - on the diseases which are rare in Africa, but common in affluent societies. And it was that linked me up with Trowell and we worked together after that for twenty years. Because shortly after that time when we met in South Africa, I wanted to amend the book that Cleave had written and I began to write a book on western diseases related to diet, and fibre in particular. I found that I could only cope with the surgical diseases, I couldn't cope with the medical ones, so I said to myself, now who could do the medical ones, Hugh Trowell. So I wrote to Hugh and we worked together for the next nineteen years until he died and we co-edited three text books together, one of which was actually, for the sake of the record, chosen by Sotheby's to be put in a time capsule and to be opened in fifty years time and see what an impact it will have on medical thinking. So that was the move then from... Well, Cleave couldn't work with Trowell either, they couldn't get on with each other, somehow.

MB That was a difficult association.

DB Yes. Working with Trowell was a tremendous help to me. He drew my attention to his 1960 book, which I knew nothing about.

MB Of course you had a rich association with Trowell from before.

DB I had a rich association but I lost it more or less. But I had from Trowell in early days, because he had been the best known physician I suppose in East Africa in his day. He was thirty years out there, he had written an enormous amount, so he was the ideal man to link up with me. And there is no doubt about it that Trowell and Cleave together, and to some extent Walker, were some of the pioneers of the whole concept of western diseases, which has been considered by epidemiologists as eminent

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<sup>1</sup> Trowell, H C., 1960 *Non-Infective Disease in Africa*. London: Edward Arnold.

as [Professor] Tom McKeown of Birmingham, as being perhaps the most important medical advance they reckon in this century.

MB Did you feel that you were walking in the footsteps of [Bertrand] Allinson and [Sir Robert] MacCarrison.

DB Well all these people came along later on you see. I naturally looked into the history and found out about Allinson and MacCarrison. Then some frightfully way out people like the surgeon from Bart's, [Sir William] Arbuthnot Lane, who got the idea that many of our diseases were due to stagnation of the colon with faeces in it. And so he hit on the idea on thinking that people should also have the colons cut out, so he used to cut out the colon, even for children to treat them for Still's disease. And then it dawned on him that giving bran would have the same effect as taking out the colon and it would be much easier all round, and so he gave up taking out colons and recommended bran. Then there were other people like Ted Dimock who was in here the day before yesterday, on Saturday. Way back in 1936 he had written a paper on treating haemorrhoids with bran and I met him when he was doing a locum in Mengo Mission Hospital in 1970. I can remember him quite well because I had been weighing stools up in Karamajong, up in a very primitive pastoral tribe, but there was no x-rays up there, so we gave them the pellets, we weighed the stools and then I filled up the back of my car with stools and brought them down to Mengo Hospital to get them x-rayed, and that was when I met Ted.

MB That's also while we are talking about you walking in the footsteps of people we must mention Jonathan Swift.

DB Well now, you see after some lecture which I gave to doctors - I gave a lot of lectures to doctors and postgraduate centres - one of them told me he had a book written by Jonathan Swift, who was perhaps the most famous graduate of my old university, Trinity College Dublin, which is having its fourth centenary - I hope to be over there next year. And he lent me this book and this was a book under the subject of 'human ordure'. Now, that is the old English word for stools and it was written by Dr Something dot, dot, dot... Swift, it was just mostly in dots; he wouldn't put his name on a subject like human ordure. But I brought the book into an antique bookseller and they assured me that Jonathan Swift was the author. Now, he was the first person ever who wrote a whole book on stools and he divided stools into different categories rather like a botanist divides plants. Now, there was the good stool which looked like a cowpat and so on, and then the worst type were those, to quote Jonathan Swift verbatim, '...were produced in small, round, distinct buttons or bullets.' And he says, 'This species, 'I have only found to flourish around institutes of higher education.' So that he recognised constipation as something which was related to the diet of different people. And of course then I did stools in vegetarians and I found they passed far larger, softer stools than non-vegetarians. So one way and another I got right into stools and I got right in...?

MB What was this telling you, Denis? You were looking at throughput really, apart from just the quality of the stool, the density, you were looking at throughput. What came out of this?

DB It was telling me that lack of fibre in the diet, which was ignored by nutritionists, was perhaps one of the most important contrasts between the diet of economically developed and traditionally living people. And of course the more we looked at it the more we found this was so. It was always considered something which made diet unpalatable and it was beneficial to remove it, but actually it has been said that the recognition of fibre corresponded to the recognition of vitamins, you see, as something which had been entirely neglected in diet. Later on I recognised that when it came to things like coronary heart disease, excess fat was just as important as diminished fibre. But Cleave would never accept that fat played any role in ill health at all, he wanted to put it all on to sugar.

MB How did he accept the fibre bit though?

DB He accepted the fibre in that he found that in the war when he was medical officer of King George V's, I think it was, that many of the naval crew suffered constantly from constipation and used to ask for laxatives. And he used to bring sacks of bran aboard his ship and he gave all the naval ratings bran and they were delighted because it relieved constipation without having to resort to laxatives. And that was one of the great stories which got linked to Cleave, was giving bran to the navy.

DB Denis you have moved towards bran and away from refined carbohydrate. When did you first start to publish your extended or changed Cleave hypothesis?

DB I think I wrote my first paper, without changing Cleave much, but just on the new idea, I wrote a paper in the *Lancet*<sup>2</sup> called 'Related disease - related cause?'. And I suggested that if certain diseases only occur in certain situations or in certain communities, you must suspect that there may be a common cause. That was the first thing I wrote and then I began...

MB Was that in the early seventies?

DB That was in '69 I think. Then I began to write a whole pile of papers on diseases and civilisation, mostly à la Cleave to begin with, but then I got off the sugar because it was dead obvious... Cleave was blaming sugar for things like colonic disease, but no sugar ever gets to the colon, as you know better than I do. He did give credit to fibre in certain things, certainly. But we got we got away from the sugar and then we got more and more to realise that you can't neglect the fat. You see, we know now that there were five fundamental changes, both between populations today who don't get our western diseases, and between palaeolithic man - our ancestors - and today, because we also realise now that we are genetically adapted to the lifestyle which our ancestors lived in for a long periods of time. And it would now be universally agreed, and it has come out very strongly in a major WHO [World Health Organisation] document recently, that the major differences are: we eat far too little fibre and far too little starch; we eat far too much fat, mostly in our meat ; far too much sugar; and far too much salt. And I think...

MB Those are our main departures from stone age man?

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<sup>2</sup> Burkitt, D. P., 1969. Related disease – related cause? *Lancet*, ii, 1229-31.



DB Those are the main departures from stone age man. But the main departures for an Englishman of three hundred years ago, and the major contrast between China, India, Africa and the western world today - and I think the two most important ones - are the removal of our fibre-rich starch foods, to the high fat animal foods, and I would put salt now as more important than sugar.

MB Right. Denis when you started to publish. How long did it take before you began to get a backlash from industry.

DB Well, the only real backlash I have had from industry occurred in 1972. I remember it because I was on holiday up in Inverness and I had recently by request given a major lecture, I think it was in the Royal College of Surgeons, but it was a major lecture in London. And in this major lecture - it was subsequently published in the *BMJ* - because they had asked me if they could publish it before they knew what the subject matter was going to be. Because in those days it was very unpopular to write a paper taking a lot of diseases together. It was frightfully awkward, no-one knew how to categorise it. And the idea of linking diverticular disease, gallstones and appendicitis together, it was unpopular. I was asked for my lecture before I gave it and when I did give it to the *BMJ*, they published it. Now, I think I was interviewed afterwards by some, perhaps some radio group, but it got into the press, because my lecture was really saying that fibre in the diet maybe protective against certain diseases, particularly some gastric intestinal diseases.

MB And we should point out at that time - people today will not have the experience - but at that time, I mean, the baking industry was really into white bread in a big way.

DB Oh, totally. After all the baking industry, the milling industry, for a hundred years they had been priding themselves on getting purer and purer bread by getting the fibre out. So they heard about this lecture and they put out a press release for any newspapers that they got, which was sent to me. And they said that it had come to their attention that some doctors and some layman were suggesting that fibre in the diet might have value, and they wanted to assure the British public, in case they were getting worried, that fibre had no value whatever and that the more you can get it out of food the purer is the food, and that was that. So I said to myself, 'I mustn't let this pass.' And I wrote to them and said, 'Could you tell me who these best scientists in the land are, because I think they are wrong and I would like to write to them?' Well, they refused, but they did give me the opportunity with Hugh of having a series of discussions over a matter of a year perhaps. We met in London, they gave us lunch, we discussed the whole matter. They totally disagreed with us, we totally disagreed with them, but we didn't fight, we kept on a friendly basis.

MB You managed to keep it sweet.

DB We managed to keep it sweet, and it paid off endless dividends, because you see, looking back now, I was invited to speak to the annual meeting of the British Millers, I was invited to address the annual meeting of the British Bakers, I was invited to talk at the conference of one of the American Milling Group. And in the

end they said, 'Well now we disagree on this so will you agree to ask us to put it out to the COMA committee - the committee on medical aspects of nutrition.' It has got rather a good name the COMA committee because it is almost in permanent coma; it takes a year to get anything out. But they sent it to the COMA committee and when the COMA committee came out with the report, what they said was fibre is obviously very important, so we felt sort of vindicated. So that was really the only sort of open contretemps. I remember we went to a reception at the Mansion House one time with my wife, and I think it was run by the millers, and my wife was talking to the chairman and he said to her, 'At home we follow what your husband says but we don't yet accept it in the industry,' which I thought was rather fun. But I have always kept on good terms with them. They do very good work on fibre now; they always have done. They produce this very exciting food Quorn [myco-protein]. And we didn't attack them and things have stayed very sweet.

MB I mean, your view is that they have adapted fairly well.

DB Oh very much so, because they know perfectly well that the only way they are going to make money is to adapt to what the public demands. And the amount of brown or wholemeal bread produced now, is five hundred times what it was five years ago; it has gone up five-fold. It is still very low compared to Scandinavian countries, but nevertheless there is much more brown bread produced and asked for.

MB Was it a positive decision of yours very early on, when you saw that modest resistance that you'd go by way of the consumer interest rather than pressure on the industry?

DB Oh yes. I never felt that there was anything to be gained by cursing the industry, as so many crank food people have done. I didn't feel there was anything to be gained in that at all. I think the thing was to try and get the truth out, because the truth eventually wins. You see it is interesting now twenty years later to think that in the very authoritative Surgeon General's report on diet and disease, which came out about two years ago, in the very first page of the Surgeon General's comments, he said, 'The major change we want in the American diet is more fibre.' And in the very first paragraph of the Secretary of State, he make the same point. So I mean things have changed out of all recognition, but don't give me credit for that. I might have been a little bit of a catalyst, but lots and lots of people... wonderful work has been done. If you think and look at this way, in 1968 there was an average of about ten published papers a year in the scientific literature on fibre. By the early 1970s it had gone up to over five... no, I am sorry within the next twelve years after that it had gone up to over five hundred a year. So that probably no individual aspect of nutrition has exploded so dramatically in such a short time as has fibre, due to many people working in many countries in many ways.

MB Denis, on the whole you are rather modest about your part in all this. There is one aspect that we have not covered, but I think we should. Once you got really in tune with the fibre requirement and where this might lead, because it was a massive, massive thought forward, you travelled enormously, talking about it everywhere.

DB Well, I fortunately... you see, yes, I had wonderful opportunities. I was doing about four to five lecture tours a year in North America, and then I travelled in India and Africa and several times in Australia. And I had the opportunity to, you see... in order to find out what was happening in different communities, I was able to go and look at the Eskimos in Alaska, and the Pima Indians in Arizona, and all these places you put missing pieces from your jigsaw puzzle.

MB And of course with things like Pima Indians, these had recently been brought to western diet.

DB Well, the interesting thing there is, you see, they changed over their diet enormously during the war. They now have the second highest rate of diabetes in the world, the highest rate of gallstones in the world, and the local culture and the local chiefs have recognised that they were far better off in their tribal ways and they are trying to go back in their eating habits. And already papers have been published showing a reduction in the risk factors of western diseases, as they go back. Now, they have done the same in Australia. A woman who thought of the Aborigines, who were brought up in an Aboriginal culture and then went to live in Melbourne and went on to pulp food and all the rest of it, fast food - and they were getting diabetes, they were getting fat, they were getting high blood cholesterol and so on - and she paid them a certain amount to go back and live for six months again in their native village and they said they would do that if they got paid for it. And all the risk factors for western diseases fell when they went back to their primitive culture, which is a much more convincing and telling argument than something done with albino mice in the laboratory or what have you.

MB So on all these travels and with the addition of all these finds, you had no reason at any time to think the hypothesis, the fibre hypothesis, had anything but a sound future.

DB No. What enormously strengthened me [was] when I went and stayed with a boy at Eaton in Atlanta, because he had done extensive work with some of his colleagues on the diet of palaeolithic, stone age man. And one of his colleagues actually went and lived with stone age people for a long period of time to see how they ate. And he was able to contrast that knowledge and the knowledge they get from looking at tools and instruments and everything, they have enough knowledge now of the diet of our stone age ancestors to have a fairly good idea as to what the basic subsistence diet consisted of. And, you see, the concept that we are genetically coded to the culture in which we lived for long periods of time makes a lot of sense, because it is estimated that we have made more change in our eating habits in the west in the last two hundred years than our ancestors made in the previous twenty thousand years. Now, any plant or any animal that you take out of the environment to which it is adapted and put it in a foreign environment, it would be strange if it didn't suffer, you would have to make up some diseases, if there weren't any.

MB Adaptation does not take place that fast.

DB No, no. So that also fitted in extremely well. And now, in view of the fact that we don't know of any culture who live on a diet close to that to which they have

been adapted, who get more than a minimum of any of our western diseases, and every culture that takes on the foreign diet – Japan is doing that in a huge way at the moment - develops all the western diseases. The whole thing fits in. I mean it would take some very strong argument to fit all the facts as a substitute. Because people have often criticised me after lectures, they have said to me, ‘We don’t believe in what you say at all.’ I say, ‘Fine, what do you believe?’ Well, they say, ‘We haven’t done any thinking but we think yours is a bad thinking.’ So I say to them, ‘It is better to do bad thinking than to do no thinking, because you could be shown to be wrong and you are a step further, but if you hadn’t even begun thinking you haven’t even started.’ I don’t get any of that now, but it is a very, very strong point that this hypothesis has been around for twenty years and no one has come up with an alternative one as a competitor; there just isn’t. I mean if it was a weak hypothesis I think there would have been some alternatives, but there aren’t any. Now, I am one of many, many people who contributed to that, but I think it is a very strong hypothesis now and it is going to take...

MB But things are moving.

DB But the ridiculous thing is this, to go down to specifics. It is estimated that in the United States of America this year, there will be four hundred thousand coronary by-pass operations done, at a minimum cost of about fifty thousand dollars if there are no complications. And that is for a virtually totally preventable disease, because if you look back at the literature to 1920, it was estimated that in America or England there would be one patient, per hospital, per year, suffering from coronary disease. And when you think that it is equally common today in black and white Americans, but doesn’t occur in Africa. You see, the same would apply to colon cancer; a lot of the same would apply to breast cancer. We are spending endless money on diseases which are totally preventable.

MB Denis we started this last consideration, this last phase of your career, thinking about the meeting with Cleave. Cleave is no longer with us, but you obviously kept in touch with him for a long time. Did he get any recognition? I mean you obviously provided a platform.

DB Oh yes he did. Oh he did. I was at a meeting at the naval base at Portsmouth where he got two prestigious gold medals on the same day. He was getting pretty frail then, he had to sit on a chair. He suffered a lot from atherosclerosis in later life and that was due to the fact that he loved fat and he would never condemn it. Yes, he did get recognition and I was very, very glad of it and I would have liked him to get more, but he did get the recognition.

MB He felt that...

DB I don’t think he ever would have felt he had enough, but he felt he had some.

MB Right. Did you retain a reasonable relationship, despite the differences and taking it on? You managed to...

DB In the latter part of his life he was very wandering and I didn't have any direct contact with him at all.

MB So that was quite sad.

DB Yes.

MB But the story was very different with Hugh Trowell, who I would like to return to again.

DB Yes. Well, with Hugh Trowell I retained the relationship with him until I gave a talk at his memorial service. He had said some years before that if he went before me, he would like me to give the talk at his memorial service in London. I wrote a short book for the McCarrison Society, a biography of Hugh Trowell, and I wrote his obituary in the *Lancet* and the *BMJ*. I was able to keep in touch right to the end and he died at exactly the right time, because he was getting frail, he was seventy-five, he had been admitted to hospital after a fall, and he was getting confused and he would not have been able to live alone longer. And a man like that, to put him in an institution or something would have been tragic, and I felt when Olive told me that Hugh had died I felt that was the right time. It just happened at the right time and he was a great man and he left a... Now, he did not get the recognition which he desired, no he didn't desire, which he deserved. I tried again and again to get recognition for Hugh, because he had made an enormous contribution to nutrition and the whole field of kwashiorkor. Then he was the first man to relate fibre to diabetes, the first man to give the name dietary fibre. He was as David Kritchevsky tells me the first man who really made him think along the lines of fibre and cholesterol and coronary heart disease. And I put him up for prizes, but you see his work was done world wide on an epidemiological basis. These prizes go to people who spend their lives looking down at albino mice in cages, on the whole.

MB But you remember him well. What an enormous contribution he made.

DB He made a great contribution and I owe him a great debt and, of course, as well as being a scientist and you see when he came back from Africa in 1960 he became ordained and he was a country parson for ten years.

MB Right, which he found an enormously fulfilling time.

DB He made a lot of contributions on various committees for medicine and theology together and I think he made a great contribution.

MB Denis, we come towards the end of our talking together and I just think that it would be rather good, you might find this hard, but it would be rather good if we could turn back again, where we started in a way, to your philosophy, a very great Christian philosophy of life that has taken you along this journey. Forget the long safari, but the even longer safari.

DB Well, I think basically - and I am going to talk along this line when I give the opening talk at the Medical Conference at the quart centenary at my old hospital, old

university in Dublin. You will know as a scientist, much more of a scientist than I am, where you get to in any life's journey depends much more on the turning you take at the cross roads, than of the power of the car engine in your car. It is no good going in for a safari with a wonderful car if you lose your way on the map and you take the wrong turnings all the time. And I see, looking back on my life, I wasn't an outstanding person as an intellectual, I didn't have a high IQ. I felt very strongly, my confidence that God has an interest in each of us as individuals and He is prepared to guide us if we seek for that guidance. And if I hadn't been guided to go and work in Africa, of course none of this would ever have begun at all. But all through life - you see looking back in my diary now, I turn to places like when I met Trowell and Cleave, and I had hardly made any entry in my diary. I didn't realise at the time that I was at a major turning point, but looking back I saw it. But the thing is in life, looking at the young people coming on now... you see sometimes medical students have asked me to write something in their autograph books and I have tended to write this, because I hold to it: that attitudes are more important than abilities, character is more important than cleverness, and the heart is eventually more important than the head. But there is no doubt about it that the things of the heart and the things of character - stickability is far more important too, you see. Persistence, people who stick at a thing rather than start off and give it up. Now, you see the matter of my marriage became an enormous matter of prayer and seeking for guidance and I owe everything in life to my wife and my family. But what I wanted to say is, that eventually things like prizes and awards and fellowships and all that, particularly as you get older, are really unimportant things. The things in life... relationships are far more important than, you know, running a department. So that throughout my life I have been strengthened by the deep conviction and the fact that there are things in life which are unseen, what Paul called the eternal imperishable, which eventually are going to be far more important than the merely physical, calculable, computable sort of things in life. And I owe everything to friends, colleagues, family, relationships and the department I worked in medicine with Michael Hutt and others. Everyone will agree that was the most productive university in Africa at that time and it was because we were all friends together working as colleagues, sharing things with each other and that is what made things go forward. Brilliant individualists, they can do great things at times, but people working together helping each other as a team, supporting each other, are more important. And so I was just one cog in a wheel. I was allowed to be in a certain place at a certain time. Now, I mean supposing Doll hadn't called me in to see Peter Cleave, supposing I hadn't gone to that conference in Kampala, or I hadn't met Hugh Trowell there. There was another man you were going to ask me about. You see, when I met (Albert) George Oettlé of South Africa; he came up to see us. I had never met him before. Incidentally, we had a lot in common in our Christian commitment. But George coming round my wards in Mulago, just said a very simple thing to me - he was the best cancer worker in South Africa - and his head turned to me and he said, 'Denis this tumour you showed me today doesn't occur in South Africa.'

MB That was the beginning.

DB It was the commonest cancer of children where I was, it doesn't occur in South Africa; well there must be something where there is a stop. And that was one of the major little points that set me out looking. And I like also to think of this. You see

there is a tendency today to think that research needs tremendous funds, tremendous back up, and that there is a direct relationship between the dollars put in and the results that come out. But I think I have been able to disprove that, because my first two grants added together, you see, for the first eighteen months we had starting the lymphoma off, both of them added together came to £25 and one was £15 and was £25. Well, I mean you might multiply that by ten now in different things, but it would still be virtually nothing. And the work we did on fibre, I mean, what did we consist of? I had a girl who acted as a personal secretary for me and I had another junior girl who did some typing - finish. Later on I had a statistician, but we had no lab staff, we had no labs to keep up. I mean it was all just fun and co-operating with people and getting people to eat. You see, each of all the hundreds of doctors who sent to me every month faithfully records of what he saw and what he didn't see, they were all putting their bricks in the building. Each one was doing his bit and I think that in any branch like this... the thing to remember is that we all do a different bit. Now, Peter had his job and you have got your job and I have got my job, each of us do our bit and we can't do the other man's bit, we have to do our bit. I was for the first time, for a long time, I took the evening service in our church here - I happen to be a lay reader - and I spoke about the time when after the crucifixion of Our Lord, Joseph of Arimathæa went to Pilate and asked for the body. Now, there was nobody else in the world except Joseph of Arimathæa who could have done that. Nobody else would have had the access, nobody else would have had the tomb to put the body in, he had it all ready. And I just thought how... you see certain people... Max Blythe is the only person who can do this job at the moment and so on. And then I thought as the 'cockerel crew', you know, and Peter felt... he realised he had let the Lord down. Now, that cock crowing spoke more to Peter than any sermon he ever heard in his life. The cock did what he did, Max Blythe does what he does, Peter did what he did and Denis Burkitt did what he did. We all do our bit and altogether it adds up to the whole.

MB Denis, I am very grateful to have gone through much of that whole with you. That has been a very rich experience for me. Thank you very much.

DB Well, thank you Max, very much indeed. I hope people will be in some way helped, as well as perhaps have their eye opened in what we have been sharing.