© Oxford Brookes University 2012

The Royal College of Physicians and Oxford Brookes University
Medical Sciences Video Archive MSVA 009

Sir Cyril Clarke KBE FRS in interview with Sir Gordon Wolstenholme
Oxford, 15 May 1986

GW Cyril, your career has come to a time when you have been President of the College [Royal College of Physicians], you have got a whole lot of fellowships and honorary fellowships, honorary degrees and gold medals and so on, and really by any standards it has been a remarkable achievement. But from the earliest days it must have looked very different, even though you came of a medical family, I think, of more than one generation.

CC Yes, that is so. I think if my father were alive today it would kill him to hear what has happened, it was so very different, because he thought we were all terrible; we all drank too much and ran after the girls and didn't do any work, and he thought that my generation was decadent. The young were never going to do any good.

GW He was a very Edwardian or Victorian type?

CC Yes, he was. He was very interested in education. He started Leicester University, actually. He was very interested, but he was very hard in a way and we were rather frightened of him.

GW But his own medical practice was of what kind?

CC Well he was in a general practice in Leicester until the First World War. He went to the First World War and then he was invalided out and was given six months to live by Thomas Lewis and proceeded to live for another thirty-five years. He never thought much of Thomas Lewis, as a clinician. Anyhow, and then he just sort of said, 'I'm going to be a consultant.' You could in those days.

GW He was a consultant physician.

CC Yes, at the Royal Infirmary in Leicester for many years, and so was my grandfather. He was a surgeon there. So we had a medical sort of backing. In fact I never had any option as to what I was going to do. I thought everybody was a doctor you know to start with.

GW But did you already have in those very early days and school days a strong liking for natural history and so on … I mean was that your?

CC Well, it happened in the First World War when I was about six or seven, my father was away at the war and he came back on leave with a story that Kaiser Bill was going to bomb Leicester; this was extraordinarily unlikely but anyhow it was taken seriously and my younger sister and I were moved out to the country to a village called Houghton on the Hill, about six miles east of Leicester, under a governess, aged

fifteen or sixteen. She was a tremendous bug hunter and it was she who got me interested in butterflies and moths. Before that I didn't have any interest in it at all. That's how I got interested in butterflies and moths. I was sent away to school at fourteen and it was all knocked out of me at Oundle as a sissy sort of job, and it really stayed underground until the Second World War when I was in the Navy all the time and I was sent to Australia for the last year which was a marvellous job, and of course the sun shone and the butterflies flew and back it all came, and that was…

GW Otherwise in medical school and so on it was a very orthodox development through Cambridge and Guy's?

CC Yes, that's right, yes.

GW You weren't at that time interested in genetics or anything like that?

CC I wasn't interested in anything except girls and fun and games, and I played hockey and that sort of thing. I was just an ordinary sort of chap.

GW Looking up your career, you qualified in '32 and you went on to get your Cambridge degree and so on and then your membership. You were doing some insurance work and so on for a period before the war.

CC Yes, I slightly ran foul of Guy's. I didn't get on with the professor of physiology. I loved the house jobs, but I never got a registrar's job at Guy's because I didn't care for physiology. We used to make fun of a chap, with Charles Baker, who was a fellow of the college, and Charles and I were great friends and we used to mock, [W R] Spurrell. Spurrell was the professor of physiology. Anyhow, I never got a registrar's job in Guy's and I got rather side-tracked into skins and VD, and then this insurance job came along which at the time seemed very attractive and financially it was £2,000 a year.

GW And you were married?

CC Yes, I was already married and I sailed a lot and I raced boats, and financially it was £2,000 a year. This was princely and so I went on in it for two or three years and I think I learnt quite a lot about insurance work. Then of course, fortunately, the war came along and that really made me.

GW You were already in the Naval Reserve?

CC Well, I joined the Naval Reserve in June 1939. There was an advertisement in *The Times* and I went up, and I had my membership and I had my MD, even though I was doing not a very high-powered sort of job, anyhow I got in and got a hospital ship at Scapa Flow. I was there for three years, off and on, looking after the Home Fleet and I got sort of going then. I wrote for the Journal of the Royal Naval Medical Service. I was terrified of being put in a destroyer, and having got a job as a medical specialist I was determined to keep it. I think fear has played a large part in my life.

GW So that in a way this was, as for me really, an interim period in a sense, but a period of great development. I mean it gave marvellous opportunities.

CC Yes, I think I enjoyed my time in the Navy more than any other.

GW Did you find it difficult to get back again? You went to Birmingham, I think.

CC Well, what happened was, I was demobilised in January 1946. I went home to Leicester to live with my ancient mother and I had no job at all, and I remember her gas bill was £20 for a quarter, because we had spent so much time looking through the *BMJ* and *Lancet* for a job. Couldn't get a job for love or money. I was interviewed at Guildford but I didn't get that, and then there was a registrarship going at the QE [Queen Elizabeth] at Birmingham and I applied for that and [John] Ryle and [C P] Symonds – Symonds I'd been HP [house physician] to him – and they backed me and I got a registrarship at QE, which I very much enjoyed, and I made myself absolutely indispensable. I was there all August and never took a holiday and bicycled to the hospital. We lived in. The salary was £350 a year and I had three children, but it didn't matter. It was a good job. And then I had known a bit about Liverpool in the war, and the jobs came up in Liverpool and I landed a job forty years ago as a consultant. That was how it happened.

GW And the academic side of it came up quite a bit later.

CC Years later. I taught students and it was a teaching hospital job, but I didn't have any sort of… I didn't know what a reader was at all, and then about 1957 or '58 Henry Cohen[1] was away such a lot the students didn't get taught enough and the dean said to me, 'Will you be a reader?', and I didn't know what a reader was. He said 'Well, the University would like you to apply.' Henry didn't want me; he wanted somebody else. Anyhow, I went to see him about it and he said, 'I shouldn't like you to apply and not get it.' And I bit my tongue because I felt like saying, 'Well I know if I don't apply I shan't get it.' Anyhow, I applied and I got it. He was very nice actually and we got on extremely well.

GW And then you got the chair [of medicine] in about 1961 or 1962?

CC Oh yes, Henry stayed on. He stayed on till the bitter end... Wait a minute in 1965 I got the chair, 1965-72. I was fifty-eight, you see, when I got the chair. He told me, originally, when I got the readership that he would retire in about two years, but being Henry he didn't.

GW And, of course, he had started at twenty-six. So there was a tremendous contrast. When did the genetics side come into it?

CC Well, it came really … the butterfly stuff came back in Australia and when I came to Liverpool I thought I would try and do something I'd always wanted to do when I was a child, and that was to breed the British swallowtail butterfly. If you put male and female butterflies in a cage together they won't mate for love or money.

---

[1] Henry Cohen, Lord Cohen of Birkenhead (1900-1977).

They need to do all sorts of fancy courtship flights and that sort of thing. So I learnt of a technique for making them mate, which is excessively simple. You simply take the female in your left hand and the male in your right and you open the male's… – the males got claspers in the swallowtails – and you introduce mum to dad, as it were, and the waggling movements and you use your imagination, and they lock together and that's it. And so I learnt… I achieved a sort of childhood ambition, and then I happened on one Sunday in October 1952 to have an American swallowtail, a closely related… a black American swallowtail, and British yellow one, and I took the black one and I just thought well, I wonder if I can mate them. And I could quite easily and I got a hybrid. I took them to the experts and they all said, 'Well, it's a beautiful thing but anyone can get hybrids and you won't get any further, you see, because they're two different species.' Well, we did, we did the back-cross; we took the hybrid and back-crossed it to the British born and got a beautiful one-to-one segregation, single gene difference between the two species, as regards ground colour. I was very excited about this and then very fortunately I saw an advertisement in a bug hunters mag[azine] from a chap called Philip Sheppard in Oxford, who was younger than I was by about thirteen years. He'd been in the RAF and had been a prisoner of war for three years, and he was wanting some swallowtail living material. I didn't have exactly what he wanted but I told him about my hybrids and he was very excited about it. I went down to see him in December '52, at the Mitre Hotel in Oxford, and he was wearing his old RAF coat, and we sort of teamed up and lived happily ever after. We did it mostly by correspondence, but then there was a job going in Liverpool about 1958-'59, that sort of time, a lectureship in genetics.

GW In the department of genetics?

CC Well, there wasn't a department. There was a sub-department that was made…

GW Of zoology?

CC Yes, it was to start with, and they wanted a lecturer or senior lecturer in genetics and of course Philip would have been marvellous, you see. The question was how to get him. I hadn't done outpatients for many years without knowing that often the way to get what you wanted was to tell the person to do exactly the opposite of what you really desired. So I said, 'Well, there's a job in Liverpool. It wouldn't do you, you'd hate Liverpool, but if you know anybody, one of your pals, there is a job going,' and left it at that. Three weeks later the telephone rang and he said, 'Can I have little bit more information about this job?' I knew I'd got the fish then, and he came and it was absolutely marvellous because he taught me genetics and I taught him medicine. We went up together, and he got the professorship [of genetics].

GW This was like the butterflies.

CC That's right. It was really very productive. He was astonished really to learn how interesting medicine was because he didn't know anything about it at all, you see, and I didn't know any genetics. It was just one of those things, completely unplanned.

GW How did the mimicry studies start?

CC Well, it all stemmed from this hand mating technique. You could then investigate the mimicry by crossing, within a species, one mimic with another, and seeing and working out how the mimicry evolved; it was the evolution of mimicry. Really nobody really knows now how. It's an astonishing thing to happen, the mimetic resemblance, the sheep in wolf's clothing, and we did a lot of work on it. Over the years we've bred all sorts of mimetic species and published a great deal together and we gradually got known about it. I was always trying to relate what I was learning with the butterflies to man, and I remember Philip and I were motoring down to the Norfolk Broads to have a look at the local swallowtails there, and I said to him, 'How can I get this sort of study into medicine?' And he said 'Blood groups', because of course the ordinary ABO blood groups are inherited in a simple sort of way, rather like the mimicry, and we got interested in the ABO blood groups. If you remember, at that time it was all the rage, the association of blood groups and disease, and people with duodenal ulcer were commoner in group O.

GW I remember it well.

CC So far as I know, no one was any better for it being known that duodenal ulcer was associated with blood group O. Anyhow, we got interested in that, and then the mimicry side of the thing was more complicated in the way it was inherited. It wasn't a single gene difference, it was a string of genes, a super gene, and again we thought about blood groups and we got interested in the rhesus blood groups.

GW That interest had started about, if I remember rightly, in the early forties. It became a complicating factor for me in blood transfusion work in about '43 or so.

CC It was discovered by Levine, and the man who's still alive – I shall remember his name in a minute – Levine is dead.[2] [It was discovered] in 1943.

GW I just thought it was the most infernal nuisance when they were first heard about.

CC I know. Yes Then we got interested in this, and we got interested in it in a way… I mean the number and proportion of people who are rhesus negative is 15 per cent, something like that, and therefore one in seven marriages is between a rhesus negative woman and a rhesus negative man, and it ought to be at its height a much commoner disease than it in fact was. And we learnt about all the naturally occurring protective factors: why babies weren't affected, and the ABO incompatibility, when the mother was not only rhesus negative but was group O, and the father and the baby were rhesus positive and say blood group A, now the babies were not affected by rhesus haemolytic disease because the mother being group O had anti-A and anti-B there which bumped off any A positive cells that had got across. They got rid of the A cells and the rhesus positivity at the same time and this protective mechanism, this naturally occurring protective mechanism occurred in 20 per cent of cases, but 80 per cent of women were compatible with their baby on the ABO system, they were both O

[2] In 1939 Levine and Stetson, and in 1940 Landsteiner and Weiner made observations which laid the foundations to an understanding of the rhesus system.

or both A, and so there was still this problem. And then we suddenly had the idea. What happened next was this. A man called Ziperski(?) in Canada, in Toronto – what's the name of the universty close by, I've forgotten – anyhow he showed that you could detect, using the Kleihauer technique, foetal cells in the maternal circulation, and I happened to see this, it was in the *Lancet*, one Friday morning. I always read the *Lancet* very early, before the rest of the team sort of were awake, and I marched in and said, 'This is just the job for us.' Because you could identify the women who were particularly at risk by doing this Kleihauer technique. We had a chap who was a research assistant called Ronnie Finn and we put him onto counting the number of foetal cells in the maternal circulation in rhesus negative women in relation to their subsequent immunisation, and, of course, the more cells they had, the more they were likely…[to be at risk]. So that was that. And then suddenly – there was some differences of opinion as to who had thought of it, but it was a very simple thought really – couldn't we in these ABO compatible cases get rid of the foetal cells. The obvious answer was to give them a shot of rhesus antibody. And I say, and it is in the books, that it was my wife Féo, who thought of this. Other people think differently, but it doesn't matter really. Ronnie Finn did a great deal of the work and we did a lot of work, all in men, of course, to start with. We took rhesus negative men, Liverpool policemen, and they were rhesus negative and we divided them into two halves, but we injected them all with rhesus positive tagged cells, and half of them we did nothing to and the other half we gave a shot of anti-rhesus antibody to, and that was fine. We got rid of the injected tagged cells but we gave the wrong antibody to start with. We gave the 19S antibody. We were advised to do this by Rob Race actually. We didn't know, we knew nothing about immunology, really. We just had this idea. Rob thought it was a good idea, but anyhow we gave the wrong antibody and everybody said, 'Those silly Liverpool fellows, we knew they'd make a muck of it.' Anyhow, fortunately, we kept going and the next time round we gave the right antibody, which was the coating antibody, the 7S, antibody, and when we did that we protected the Liverpool policemen. The local press, the *Liverpool Daily Post* had 'Men of Merseyside: Mothers to be' and there was a photograph of the police and their band. They were marvellous people, the police. The more you told them about the risks; you know, injected tag cells and (??), the more they said – this is very old-fashioned – they said, 'Doctor, we trust you.' You know , we'll all be laughing now when I say it, but that's what they actually said, and I think that the general public will volunteer for pretty well anything provided they can see that it's got some real spin-off, and here was a disease that we thought could be wiped off the face of the earth.

GW You were not seen to be doing it for scientific fun or anything. But it is astonishing, when you think of the large families of the past. Nowadays you could imagine you could miss it because of people having only one or two at the most. But it certainly transformed the situation.

CC Yes, we were very pleased about it.

GW You first published in *BMJ* or where?

CC Yes, we published… well, what actually happened, the Americans were on our tail. The Americans thought they got there first, but they didn't. Anyhow, it was 1960 I think that we had a meeting of the Medical Institution and I was secretary…

GW The Liverpool one?

CC The Liverpool, and I was secretary of it at the time and I thought it would be good plan if we presented what we were doing in the department, in a sort of genetical symposium, you know. And I put in the rhesus-rhesus business and Ronnie Finn gave that particular bit. It was only a paragraph, but suggesting that giving anti-rhesus antibody might do the trick, and this was an abstract and it wasn't vetted by anybody, you see, but it got in and that is the first time that it was mentioned. But it was a combination of me being secretary, Ronnie Finn doing his stuff, and it was in 1960 that the idea was put forward. Then we had to do, of course, all the policemen, then rhesus negative men and then post-menopausal women, and all the rest of it.

GW You did that too?

CC Yes, because we wanted to be very careful it didn't do any harm. It took about ten years to do the whole thing. And then there was an MRC [Medical Research Council] trial and things and, you know, it was done throughout the country or various parts of the country.

GW It is interesting, I mean considering the tens of thousands of transfusions we gave in the war with no reference to rhesus factors at all that you could find a population in which you could do these experiments.

CC Yes, it was. Of course, none of us knew any… we learnt immunology as we went along. Although I was nominally the boss I didn't know any more than anybody else and it was fun. The great thing about the whole of the rhesus research was it was enormous fun because we were not immunologists. We were just general physicians really, with an increasing interest in genetics, which all stemmed from the butterflies.

GW But it put a stamp on Liverpool medicine, didn't it, which I hope will endure.

CC Well, I thoroughly enjoyed those years.

GW When did the Americans get in on the act?

CC Well, the Americans got in on the act at about the same time as we did, but they had a different sort of idea about it – feedback. And they were all in favour of giving gammaglobulin during pregnancy.

GW Yes, I now do remember that being proposed.

CC Which didn't work, but it was nip and tuck really. It was they who used gammaglobulin; we used plasma, and of course, gammaglobulin is very much more convenient to administer. And we had a lot of fun and games with the Yanks. I think all is peace now, more or less.

GW Well, I can say that I don't think they were very forthcoming or very ready to be forthcoming about recognising what had been done by you and your team and to

some extent I think it endures. You have received great recognition here and, of course, you've had the Albert [and Mary] Lasker [Foundation] award and Gairdner award, which I suppose must have been balm to your soul.

CC Yes, yes, well it's largely forgotten now, but still.

GW Lets move ahead a little, because after your work in Liverpool and so on you were by no means finished with your research career, and after being President of the College [the Royal College of Physicians], you're now director of the research unit [of the RCP],[3] and this is beginning to throw up all kinds of things of interest. I think you started first, didn't you, on deaths among hospital patients where – theoretically anyway…

CC Tender age.

GW Tender age. I mean, yes, they ought not to be dying.

CC That's right. Yes, we did. I think David Pyke actually thought of that. Yes, we did have a look at that. It wasn't very well controlled and we were attacked. Still, we got known a bit.

GW I think you exposed that there were extraordinary inequalities in survival rates in that age group, with very common operations and illnesses.

CC Yes, I enjoyed this and particularly now, actually. George Whitfield works very hard and is a good chap and knows all sorts of people. We were always being attacked for not having a statistician. Well, I used to preach, like everybody, you know, always consult your statistician before you start to experiment. I never do that now. I have the idea, do a little pilot survey, and then consult the statistician. In my experience statisticians always put you off. They say well you must do this, that and the other, not knowing… most of them are non-medical, they don't understand that you can't do it. So I don't approach statisticians early.

GW Hence the success of the unit. What led on to the longevity studies.

CC I simply happened to see… I saw something in the medical press that there were now two hundred centenarians in the country compared with twenty, thirty years ago. This is three or four years ago, and at least that is what I thought I read, and I thought this was very interesting and I mentioned it to Dick Bayliss who had joined us and he said, 'Well that's very interesting,' he said 'why not find out from the Queen.' And he was, of course, the Queen's physician, or I forget whether he had just resigned. Anyhow, he said, 'All you've got to do is write to Buckingham Palace. They won't give you the names but they'll give you…

GW …how many [congratulatory telegrams] they do a year.

[3] Sir Cyril Clarke was President of the Royal College of Physicians (1972-77), and Director of the Medical Research Unit of the College (1983-88).

CC	How many, yes. And the answer is they do two thousand now compared with two hundred, thirty years ago. We got this all confirmed by the Office of Population and Census Surveys, and it is a fact that it has gone up by nine times, and 85 per cent of them were women. That was, I thought, a very interesting statistic. I mean we were all told not to smoke and drink and take drugs and that sort of thing, but the fact is that in every decade people are living longer, so I think you can take what the doctors say with a pinch of salt, or no salt!

GW	And now that is… is this [study] now on a sort of longer term basis?

CC	Well, yes, I think it is, really. A lot of people think that the reason women live longer, which they do in this country, is that there is something sort of biologically different. Well, they are biologically different, and they think its hormones, or that while they're still having babies they've got a sort of delayed… their puberty.

GW	You mean a parallel to the nutrition studies, where you postpone maturation and therefore you've got a longer life, and in the same way you think that during pregnancies they stand still, so to speak.

CC	That's right. But I think if this were so, the maximum age of women ought to be the same, but longer, longer than men, but it isn't. I mean the record is one hundred and twelve or one hundred and fourteen or something like that, and it is the same for men as for women. You'd think that if there was a delay…

GW	Yes, then women would inevitably have a decade or something more.

CC	Yes, and that isn't so. Very recently I got interested in other countries, and the Amish I discovered there that their men live the same length of time as the women.

GW	I've forgotten where they are.

CC	Pennsylvania, aren't they? There are several groups of them. They came from south-east Europe. I think Alsace-Lorraine they came from. They were a religious sect.

GW	Yes, they were persecuted.

CC	But they are European, I mean genetically, they are the same sort of thing as…

GW	But they were intensely puritanical.

CC	Oh, intensely puritanical.

GW	No alcohol, no smoking. No tea or coffee. Do they take things of that kind?

CC	I don't know about tea or coffee.

GW	Mormons of course don't.

CC	They have very good medical attention. They don't have any nonsense about no blood transfusions. The medical attention and the midwifery are excellent. They are perfectly rational medically, but they live off the land and they have no nasty motorcars or motor bicycles and they don't shoot anybody...

GW	It's a sort of perpetual Jewish Sabbath, is it?

CC	That sort of thing, yes, and I thought it was very interesting because it seems to me to show pretty conclusively that it's environmental factors that are responsible for our demise while the girls go happily on, and of course don't retire, you see. They go on making our beds and emptying the chamber pots and, you know, buying the food, whereas men tend to retire and take the dog for a walk.

GW	They had the statistics among the Amish? They kept records?

CC	Yes, they have. I've only just sort of got going on this. I took some time to get a reference to what they actually die from, but it's is well down in cancer and in cardiovascular disease on the male side, but I haven't really got going. I haven't got Richard Doll onto it yet in any sort of big way.

GW	Oh, I think he's on the verge anyway and probably snapping at your heels.

CC	But we've got him now in the unit and of course he and Dick Bayliss, who knows everybody…

GW	Of course, one of the nice things about all this is the fact that the [College] Fellowship is now so wide, not only in the country but around the world, that you have a ready made team of colleagues, have you not, for almost any kind of enquiry you'd care to set up.

CC	Yes, we have and we're all geriatric, but that doesn't matter very much. We collaborate with the young, other Colleges and other groups, and we of do the organisational work and have the ideas to some extent.

GW	And of course you have the power to publish and report and so on, which some of the younger people wouldn't find so easy.

CC	No, and we make them… Nuffield and Wolfson… with our grant from the Wolfson Trust, Wolfson Fellows…

GW	Yes, they were very generous, yes. You were at one time, going back quite a long way, a Nuffield Research Fellow yourself, weren't you, when you mentioned Nuffield?

CC	I still am. They supported us for a number of years and then – I've forgotten the name of the secretary – but he thought we'd had about enough. Then he went…

GW	Oh, you mean…?

CC Yes. He… fish farms.

GW He's still alive, going well.

CC Still alive doing well. But there's a new chap; Anthony Tomei now is the assistant director. So I went to see him two years ago, and told him about the butterfly work and I got a grant for two years. It was extended to three, and I've just heard that I've got it for another three. It's only a small amount, but its worth having. I love the Nuffield. There's no sort of fuss about filling in all those damn forms that you have for the MRC. At the Nuffield you just write…

GW I think one of the tragedies was when the motor industry failed and from being a very rich foundation they became a very modest one, because they always were very flexible and imaginative.

CC I met Nuffield. Nuffield was a great friend of [Sir John] Conybeare. I was HP to Conybeare and they played golf together at Huntercombe, and it was 'Cony' who persuaded Nuffield to give so much money to medicine. I think it is to the credit of 'Cony'.

GW It's a good argument for playing golf. His generosity, of course, was phenomenal for the time, wasn't it, and it changed so many things and gave just this flexibility for research.

CC They rang me up when… they gave us four hundred thousand pounds to build the Nuffield Unit of Medical Genetics in Liverpool. They rang me up one day and said could somebody come and see me at the Nuffield, and I thought, Oh God, they want me to referee something, and they came up and offered this money, you see. They wanted me to be the director. Now, Henry [Cohen] was the professor, you see, and this was rather tricky. They didn't come to see Henry they came to see me, and so this had to be rather adroitly managed. However, Henry was very nice about it and he said as long as it was part of his department, I could be the director.

GW This was medical genetics?

CC It was medical genetics.

GW And you became actually... you had the title, was it a Nuffield…?

CC Yes, the director of the Nuffield Unit of Medical Genetics.[4] I was reader of medicine.

GW Of the medical school faculty?

CC Then professor of medicine. I was never professor of genetics in any way.

[4] Sir Cyril Clarke was Director of the Nuffield Unit of Medical Genetics (1963-72) and Nuffield Research Fellow (1972-76).

GW Director of the unit. You went across to New Jersey at one time with Nuffield support.

CC I went across to do for about a fortnight to do a teaching course on genetics. I really knew very little about it, but I did go to Seton Hall. It was one of the American…

GW One I am using at the moment, wearing another hat.

CC I thought it's gone.

GW Well, there's still… but what has remained from there in New Jersey is being used for clinical training.

CC I enjoyed that very much, though I wasn't there very long.

GW Otherwise you taught and gave considerable credit to your naval travels in Australia and so on, which changed things for your life, but travelling otherwise in the States and elsewhere, it has not come too much perhaps?

CC No. I did go to Canada and I have been to the States several times. I went to China four years ago, and more recently I have been to Hungary twice. I have got around a fair amount, not as much as some people.

GW But as President of the College, of course, you had to go then.

CC Yes, I went a fair amount to America then.

GW How do you feel, looking back? Here you are, you go through an ordinary Guy's training and you end up more or less where you are. Do you think that the opportunities exist still today for the – not to be too rude – but the odd bin or whatever you might call it, to get through with what they have an interest in and the talent for doing? Do you think they will always break through?

CC I think so. People sort of say, oh you know, there is too much administration and all this… but anybody who really is interested in anything, he works on Saturdays and Sundays, he doesn't pay any sort of attention…

GW No, but in the selection of students for medicine, do you think there…

CC I am not sure.

GW I am worried that they don't like uncomfortable people to come in.

CC No. You had to be a good scrum half to get into Guy's, that made you a certainty. And of course in Leicester, which had a very good reputation for jobs outside London, the house jobs… and Leicester Tigers, of course, they used to take in good scrum halves and fly halves and, you know, full backs and things into…

GW And this made a difference?

CC That got them the job in Leicester Royal Infirmary, and I think they made jolly good doctors.

GW All the sneers at St Mary's in the old days, I mean, there they still turned out incredible doctors.

CC Yes they did, and of course, 'Corkscrew' Moran,[5] when I was at Guy's was an anathema.

GW On a purely personal side we haven't mentioned your sailing activities except that when you were doing it as a student or houseman, but you kept that up over all the years and it's really been quite a major hobby would you not say.

CC Yes it has. I still race small boats. I got an Olympic trial in '49. I think I was the worst Olympic trialist ever. I mean I am a competent club sailor, but when you get into the sort of top class you realise the difference.

GW That's nearly professional isn't it?

CC Yes it is. You realise that you are useless. But I still race regularly or try to. I don't altogether enjoy it, but I hate not doing it really, that's what it is. And we race on the Welsh Dee and there's a class of about forty boats there and a centre board boat. I need a partner, a young partner, to do the heavy work but we still endeavour to creep around.

GW You have always managed to keep that side of your life, I mean, whatever the pressures of teaching and clinical work and so on, and writing because after all you have written quite a lot.

CC Yes, well Féo my wife has done an enormous amount there. She is a sort of secretary who is on duty all day and night, and she can sort of review books and she has got more of a sort of acute brain for genetic problems than I have even though she may not know the medical aspects of it. But it does mean that one's work can really be duplicated. Because I mean this morning she's up at the zoo doing the butterflies.

GW You've kept of course always breeding facilities at the zoo?

CC Yes. We have had them at the zoo and in Liverpool and in my home. We keep messing about with them.

GW You came into the medical genetics in this extraordinary way through butterflies, but has it led to your taking a greater interest in, well, a major interest in genetic disorders in medicine as a whole.

[5] Charles McMoran Wilson, Lord Moran.

CC Yes. In medicine as a whole; I am not terribly interested in these rare [genetic disorders].

GW Of which we have some two thousand, I think.

CC That's right. I mean the geneticists really, they don't do general outpatients. I did five outpatients a week for twenty-five years, you see. And ordinary outpatients, not special outpatients, and I was more interested in people and the sort of illnesses they get than these sort of all or none diseases, which the geneticists all love you know, (?) syndrome. The more I see of medicine, the more I think the environment is important, and I think things are often called genetic are really due to faulty upbringing. I mean, I think that, you know, when you are at your mother's breast you may be being influenced. So it has interested me very much the knowledge of genetics, but I think it's really highlighted the environmental factors.

GW But of these all or none disorders which we are beginning to acquire the facility to diagnose *in utero* at about six, seven or eight weeks or something of that order, with chorionic material, and then they can more or less, more and more identify the genetic problems. Sooner or later this means that a print out will be given to the expectant parents and they will see exactly what sex and colour and other…

CC But you see, you take spina bifida and anencephaly. Well now, you can predict these very often, but anencephalics always die so you needn't really worry about them. Admittedly, they're a bit of a trouble psychologically. But I mean they are always dead. Now, spina bifida, you can't really tell. The ones with the big defects usually die within a month or two. And the smaller defects you can't tell which are going to be batty and which are going to be mentally normal, and I have been round homes with spina bifida children playing as… I mean they may be paralysed and are incontinent, but they are bright as buttons. Should they not have been allowed to see the light of day, I find it very difficult?

GW I was bringing this up largely because the problems seem quite insoluble; there are going to be no dividing lines where you are going to say… I mean, there are going to be some where you obviously terminate and others where you never would, but in between there is everything in the world.

CC Everything in the world, yes, and I don't know, I suppose it's old age really I get more sympathetic towards the handicapped. I think doctors may be wrong. I mean the number of women who are aborted with normal foetuses, it is by no means nil and there are quite a number of them who...

GW Oh huge numbers are [aborted] for their own sakes or the families' sakes, of course, as well. We have heard this week of the abortion of Arab women who haven't wanted girl babies, and some people are prepared to do that illegally. There you are here with a great reputation in medical genetics and as you said a moment ago, you feel the environment is still supreme in many ways.

CC Over a life time. I mean genetics is obviously important over a million of years or thousands of years, but in a life time I think the environment is important.

GW I have a feeling that all these… whatever it is in the males that is holding them back from living as long as their wives, women – it is really rather like the clean air act, which we all thought wouldn't operate for ten, twenty or thirty years and that we wouldn't see any benefit, but nevertheless it was a good thing – but there may well come some change in habits for the male which would make a difference within ten or twenty years.

CC It has made an enormous difference in incidences of respiratory disease.

GW Even the cigarette...

CC The pollution.

GW The pollution has made a big difference, yes.

CC To the number of deaths from respiratory disorders since the clean air act came. And evolutionary the moths have altered completely. We've just done a survey on it over twenty-five years, and the proportion of the black winged in Liverpool has fallen from 93 to 60 per cent since the introduction of the clean air act. I think it has probably done more to increase longevity than possibly anything else, except central heating or that sort of thing.

GW My mother would argue with that.

CC She doesn't care for central heating?

GW Well, you know up in Yorkshire it is not quite moral. Cyril, I think we have touched on many of the things that I wanted to hear from you. Would you have really changed anything noticeably in your career if you could, if you were doing it again?

CC No. I think I have been extraordinarily lucky. I think what I have learnt is that planning careers is not altogether a good thing to do. I mean, seize opportunities, I think, and see, this is the sort of thing for me. No nothing. I was extraordinary lucky in my marriage really because I got sort of caught on the rebound and Féo was sitting on the club lawn at Itchenor where I sailed and I took a fancy to her and whisked her off and it has been...

GW Extraordinarily lucky, and all of us who know you both would warmly agree. You might just mention Charles, of course, your son is following not absolutely in the same footsteps but certainly…

CC He climbs.

GW He climbs where you sail.

CC Yes, I keep at sea level and he climbs quite a lot. And the middle one is in ITV [Independent Television] and he does *World in Action*, and the eldest one puts things on roads. What is so interesting about them is that my eldest boy is very right-

wing and all their children go to public schools and all that sort of thing, and the middle one, the ITV one, is very left-wing and they all go to comprehensives. And I don't think it makes much difference really; the comprehensive one has just got a scholarship to Balliol at Oxford. So, I don't know, but it is very interesting watching the children, how they behave.

GW Well I could make the comment that they all share the Clarke genes and a fair amount of mimicry coming into it too.

CC Well maybe...

GW Thank you very much indeed. It was good of you to come here today and unless there is anything else you would like to say, I am just very grateful and we shall be very happy to have this record of your talk.

CC Well thank you very much indeed.