

The Royal College of Physicians and Oxford Brookes University

Medical Sciences Video Archive MVSA 073

**Sir Arnold Burgen in interview with Lord Walton of Detchant  
Trinity College, Cambridge, 29 May 1992**

JW Sir Arnold, as you know this series of video recordings is being prepared for the archives of the Royal College of Physicians of London, the idea being to complement the rather dry as dust biographies that are published in *Munk's Roll*. I'm grateful to you for the opportunity of talking to you about your life and career. First, I'd like to begin by asking you a little about your childhood and early life. I see that you were born in 1922, a very good year. You've beaten me to the septuagenarians by about three months. Where were you born, and into what kind of family?

AB I was born in East London. My father was the son of immigrants from Poland and was brought up in the East End of London, and really by his own efforts got a good education at City of London School and became a technician in a firm of chemical analysts in the City of London. And I was actually born in Clapton in East London but when I was three years old we moved to North London to Finchley - of fame for certain reason these days<sup>1</sup> - and I spent the rest of my childhood in North London. I went to local schools of not particularly great distinction. I went to Christ's College, Finchley as a high school until I was fifteen.

JW Christ's College sounds a pretty distinguished name, was it then a grammar school?

AB It was a grammar school that dated from about the eighteenth century and had seen better days I would say. When I was fifteen I had made up my mind I wanted to be a medical student, become a doctor.

JW I'll come back to that.

AB And for that reason I had to move schools because Christ's College had no biology at all and I needed to get some biology. So I went to another local school, the Wodehouse School, which was a modern school, but one that I enjoyed greatly because they recognised that I had a bit of talent and just let me get on with things. And I had a wonderful time, doing practical science there, just by myself.

JW Did you have any brothers and sisters?

AB I have an older sister, four years older.

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<sup>1</sup> Margaret Thatcher served as Conservative MP for Finchley from 1959 to 1992.

JW She didn't go into science?

AB No.

JW No, I see. So you were the only person in the family to go into science and medicine. Going back to Christ's College, Finchley and to the Wodehouse School, apart from your teaching, what would you say are the most abiding memories of your schooling?

AB Well, I think it was just a very happy school time, I don't have any very crisp memories of it. I was always a very self-contained sort of boy, bookish. I quite enjoyed sports but I wasn't terribly good at sports. And I just read everything I could get hold of. The local public library and the local park were places where I spent most of my time.

JW Yes well, I remember reading popular books on science, like Lancelot Hogben and people of that nature, in those days. Is that the kind of thing?

AB Yes indeed. And Andrew Huxley's half-brother's [Julian Huxley] books on biology.

JW Exactly. So why was it that you decided you wanted to be a doctor? Was that due to the influence of any particular individual or was it just because of what you'd read and seen and learned about it?

AB I don't think I really cared, frankly. My real interest was chemistry, but my father wanted to be a doctor and never had the chance, and I knew that, and he was keen that I should become a doctor and I never really objected and went into medicine and thoroughly enjoyed it.

JW And was the Middlesex your first choice, was that the one you chose from the beginning?

AB The Middlesex was my first choice. I applied to Middlesex and Westminster. Westminster accepted me; the Middlesex did not accept me and I took their entrance exam later and they had to accept me.

JW Why, because you got a scholarship?

AB Because I got a scholarship.

JW I suppose you took the older higher school certificate in those days, as indeed I did, and what subjects did you take?

AB I took chemistry, physics, biology, mathematics and modern languages.

JW You took five in the higher?

AB Yes.

JW Oh well, I thought I was unusual in taking four. No doubt you got a very good result.

AB A reasonable result.

JW Right, very good, well I won't go into that in any detail. Now, turning to the Middlesex Hospital. In your basic science training, were there any particular teachers that impressed you, that inspired you?

AB Yes, there were two people really. Samson Wright was the main influence. He was an absolutely wonderful teacher of physiology - taught in the Socratic manner, which I liked very much, always asking questions during lectures and he was a great inspiration and undoubtedly influenced my future career. John Kirk, in anatomy, was a very fine teacher too, of a quite different type, such a wonderful upright man, a great example to everyone. But it was really Samson Wright that influenced the way I went in the future.

JW There was nobody particularly in the pharmacological field then.

AB No, actually at that time there was no pharmacology department. There was Cyril Keele in pharmacology who I got to know very early on, and later became an important influence, but really that was after I graduated.

JW And who were the giants of your clinical course? Were there people whose clinical training was particularly impressive?

AB Yes, I suppose Beaumont in medicine and Gordon Taylor in surgery were the two most impressive people.

JW Yes, I remember going on a ward round with Beaumont before I took...no, after I took my membership. Now, you qualified in '45 which is the same year as the one in which I qualified. I suppose, like others, you were required to serve in the SDC [Student Defence Corps] and so on, were you?

AB No, because unfortunately while I was a student I acquired tuberculosis.

JW I see, yes.

AB I spent a year off in a sanatorium and qualified rather later for that reason.

JW Yes, you would have qualified perhaps in '44. But you didn't have to have things like any kind of collapse and so on - pneumothorax?

AB Not at that time, no later.

JW I see, so it reactivated did it?

AB Yes, I had a very bad episode in 1953, and had a collapse then and almost had a thoracoplasty but the antibiotics came just in time for me.

JW Just in time, and the whole thing was eventually resolved and cleared up, good. Now, you took your membership extremely early, just a year after qualifying, '46, exceptional, which again was, I suppose, commoner in London than it was in many provincial centres at that time.

AB It wasn't very uncommon, I don't think.

JW Wasn't it? But anyhow, you got that in '46. Then after being a HP [house physician], you became a demonstrator in pharmacology, is that right, or was it physiology?

AB Well, it's a mixture in a way. What happened to me when I qualified, at the time I qualified, I had a reactivation of tuberculosis and I spent a while in the Middlesex, just on a ward there, and when I came out of that, Samson Wright said to me, 'Why don't you come and spend a year with us.' I told him I wanted to be a paediatrician and I said, 'Yes, a year but then I'll go back to paediatrics.' But I never went back to paediatrics is the answer to that.

JW Why paediatrics?

AB I don't know why. You know one has these fancies. I just liked children's medicine at the time.

JW This is interesting, Arnold, I mean you probably don't know this but I wanted to be a paediatrician, but that was because of the influence of James Spence, my great teacher and mentor, and I changed course later. But you went into pharmacology. I suppose in a way you would be discouraged from doing paediatrics because of your tuberculosis at that time, which was an important point. And so the pharmacology you did, was that in Samson Wright's department?

AB Well, actually I first went into Samson Wright's department and then the Middlesex founded a department of pharmacology under Keele and I became the first demonstrator in it.

JW Now, was that the time at that stage, that you started to become interested in research or had you had any kind of dabbling in research as an undergraduate?

AB I had a bit of dabbling as an undergraduate. I produced a rather half-baked paper on anaesthesia actually when I was an undergraduate, on anoxia during anaesthesia, which I did during vacations and I did it in a friend's dental surgery in St. Albans, sitting behind the dental chair and sampling patient's breath during nitrous oxide anaesthesia. So that was my first bit of work actually.

JW So what type of research did you then take on when you moved into the department of pharmacology as a demonstrator and assistant lecturer?

AB Well, I got straight into acetylcholine pharmacology, which has really stayed with me for most of my life, and that was for two reasons: one that I had been enormously influenced by Henry Dale...

JW I was going to ask you that.

AB Henry Dale was a friend of Samson Wright and I had got to know him at the Middlesex and started reading the papers and their influence. And the second reason was that during the war you may remember nerve gases were first developed and I started doing the pharmacology of nerve gases and that of course is acetylcholine pharmacology. That's really how I got into that area.

JW Right. Now you were there until 1949, and it would appear then, that you moved directly to a chair of physiology at the age of twenty-seven.

AB Yes.

JW Now that's quite exceptional.

AB It's unusual.

JW It's very unusual Arnold, yes. Had you, and I don't recall, had you actually done a doctorate or anything in the interim, you hadn't done a PhD or anything like that?

AB No, I've got a funny history there. I registered for a University of London PhD, and I was told because I was a demonstrator and doing some teaching that I must spend four years over it. I completed the work in one year and I couldn't see any point in carrying on, so I never took a PhD.

JW But nevertheless, I'm sure, out of that, you produced a few papers.

AB Yes, I did indeed.

JW How did it come about that you went to McGill, how did that arise?

AB Interesting story, too. Our second child had just been born. I went to see my wife the day after and on the way home I met a friend who was at the National Institute for Medical Research, Hank MacIntosh. And we were chatting and I said I'd just come from seeing my wife so he said, 'Why don't you come home and wet the baby's head!' And we went home and had a drink together and he said, 'You know, I'm going back to Canada.' He was a Canadian and we got chatting and he said, 'Would you like to come with me?' I said, 'Sounds interesting,' and so we chatted on and it got to sound more and more plausible. I went back to see my wife the following day and said, 'How about going to Canada?' And she said, 'It's a bit of a shock but sounds interesting,' and we went on from there. And the vice-chancellor came over and interviewed me at the Athenaeum.

JW Who was the vice-chancellor at McGill in those days?

AB Gosh, I can't remember his name I'm sorry to say.

JW No, well we shan't necessarily pursue that. But those were the days, long before the separatist problems of Quebec had arisen, and so no doubt you found this an extremely happy environment.

AB It was a wonderful time. I mean, Hank MacIntosh has remained my dearest friend. And we found a department that was completely desolate and between us we built up a very fine department of physiology. And it was exciting; exciting developing the teaching and exciting getting on with research and starting from nothing really.

JW Good. So you stayed there really for thirteen years and did you live in Morrell up on the hill?

AB Yes.

JW You did.

AB Well, a bit lower down actually, it was too expensive up on the hill.

JW Exactly, but looking down on the Scottish baronial architecture of the Royal Victoria Hospital. Where was your department?

AB The department was just below that actually, in the main campus, what was called the medical building in those days.

JW Yes, of course. And one thing that I do remember when you talk about wetting the baby's head, is the magnificent whisky sours of the McGill Faculty Club, that I was introduced to by some colleagues there. So what would you say during your thirteen years at McGill, apart from building up the department and teaching, what were your principal research interests, and please don't in anyway feel that you're being immodest? What were your principal research achievements would you say during that period?

AB Well, when I got to McGill I carried on for a while doing work on cholinesterase, but, as I told you, I got a serious bout of tuberculosis.

JW That was in '53 in Canada?

AB Yes, and after that I decided I wanted to start something fresh so I started doing intracellular studies on the heart - entirely new field for me, entirely new field, no one had done it before. And that was an interesting achievement. I was interested particularly in vagal control of the heart, and showed the first mechanisms by which the vagus does control both rate and force of contraction of the heart. I'm sorry, I've got my timing wrong, that was before I got ill. After I got ill, I changed again, because in that year everyone was doing it, and I felt I'd got so far behind that I needed to start a new subject. So my new subject was the mechanism of salivary secretion. I've spread myself around as you'll discover, John. And that proved to be an extremely interesting study that I

continued right the way until I left McGill, and didn't continue when I came to Cambridge. So that was one area. I discovered the earliest phases of ionic changes in secretion in the gland which have stayed, I think, as a landmark in that particular subject, and explored a whole range of aspects of secretion: non-electrolytes and electrolytes and control of osmotic levels in the gland. It's an interesting gland to work with because you've got such good controls through nerve. So that was one major area that I worked in at that time. In 1957, I had a new activity in parallel, and that was that I spent half my time at the Montreal General Hospital organising a medical research department there.

JW Well, I saw that you became the deputy director of the University Clinic at the Montreal General which of course was Osler's first hospital in Montreal, as I remember very well. I don't suppose you came across someone who worked with me for eighteen months in Newcastle, Albert McGuire.

AB Oh very well. Very distinguished neurologist.

JW He's made a very considerable name in neuroscience. And another name I suppose that one remembers from those days is Ronald Christie.

AB Yes, but he was at the other hospital.

JW He was at the other place.

AB My chief was someone you might have known, Douglas Cameron. He was at Oxford and came back from Oxford.

MW Of course. So this gave you not only the opportunity of continuing your physiological studies but also of a clinical component. What did it involve?

AB Well, it involved really, to begin with, setting up labs in a few rooms in the hospital and eventually developing a whole department there of basic research related to medical practice. And we got involved in a lot of things; one was folic acid metabolism. I've always had this sort of facility of someone coming along and saying, 'I'm interested in so and so. Can you do something about it?' Douglas Cameron was interested in folates, the relation of folates to haemolytic processes, and he said, 'I'd be delighted if you could do something on this.' And I got interested in doing folate metabolism and understanding the metabolic conversions of folate, so that became one of the major activities there. We also got very interested in the distribution of other substances, and I worked for instance on distribution of magnesium both in normal and diseased states. I found this an extremely interesting thing. I also used to do teaching. I taught all years of medicine, so that there I taught the third and fourth years of clinical medicine with Cameron. And we'd have cases brought in that neither of us had ever seen and he would essentially deal with the diagnosis and the clinical handling, and I would, off the cuff, try and deal with the metabolic and other disorders underlying it. And we'd have a group of students there - students would present the cases. I thought it was a wonderful way of teaching, and of course, off the cuff like that, you can't answer everything so the following week we'd come back and with mature considerations on things.

JW Were you in anyway involved even peripherally with the work on stress and steroids?

AB No, I knew Hans (?) of course and knew what he was doing, but actually steroids is something I've never had anything to do with, steroids.

JW No. Had you intended when you went to Canada, do you think, to make the rest of your career there, or had you always thought of it as a kind of...?

AB I thought of it as a five-year job. It just sort of slipped on, I enjoyed it so much.

JW Indeed.

AB I was really very surprised to come back here in the end.

JW Was this an invitation to come to the chair of pharmacology in Cambridge?

AB Yes

JW It was an invitation, I see. How did you first hear of it, how did it come about?

AB It came about through Hank MacIntosh from Jack Gatherer who was one of the electors. And I thought about it, and I thought, well, sounds an interesting change...challenge. I was very comfortable where I was, but it sounded like a new thing to do. I hadn't really particularly thought of coming back except I had elderly parents in this country and it would be nice to be back with them.

JW So you would be very new to the Cambridge scene?

AB I knew nothing about Cambridge.

JW Which of course is very different, just as Oxford is very different too, from what you had experienced in your former medical school.

AB Absolutely.

JW You became a fellow of Downing on appointment. Had you known anything at all about the college system?

AB Well, only in a very peripheral way. And the way I became a fellow of Downing - I was pre-elected before I came back, and when I went to my first college meeting one of the senior fellows said to me, 'Well, you're the only fellow that we ever elected on a photograph.'

JW I see, it wasn't one of those chairs that was specifically allocated by the university to a college.

AB Well, Cambridge doesn't do that. It so happened that my predecessor in the chair, Verney, Basil Verney, had been a fellow of Downing, and that's I suppose why Downing were interested in maintaining the connection.

JW And what was your reaction? I'd be interested to know this, because having myself moved, not from London but from a provincial school, to Oxford, it took some time to become attuned to the college system and in particular to the college tutorial system and the question of college fees. What was your reaction to that situation?

AB I didn't find that terribly difficult, I found it much more difficult to get used to the university than to the colleges because the university administrative system was pretty impenetrable. It still is. It's less so than it used to be. But I was used to being able to go to a dean and tell a dean what I wanted and have an argument with him, but there are no deans here. There was a general board which you couldn't go and see, and there was no way that you could tackle the general board so you went through officials and that took a very long time to get used to and to find out how you got round the system. And I'm sure you've had the same experience. But the college system I settled into rather quickly without much difficulty. As a professorial fellow of course I was not involved with teaching.

JW Not involved in tutorials, no. Now you became the honorary director of the MRC Molecular Pharmacology Unit in 1967, which was about five years after coming here. Were you instrumental in the founding of that unit, or was it one that already existed before you came?

AB No, it didn't exist. I went to John Gray and told him that there were certain things that I wanted to do, that I thought were areas in which pharmacology could advance. And they were happy days then when you could go and talk and get a response because finance wasn't so difficult as it is now. And so within three months the council [MRC] had agreed to this. I found a site in the university to set it up, and six months after the idea came to me, there we were going.

JW Well now, what were its terms of reference and its principal objectives?

AB Well, its objectives were to try and put a real scientific base into pharmacology. I mean, one of the problems with pharmacology is that it's phenomenological: you give a drug, you get an effect. I wanted to know the mechanisms of how those effects were produced, and particularly the chemical basis of them. So the objective was to use chemical and physical methods to understand how drugs interacted with structures in living organisms and how these resulted in contraction of muscles or secretion of glands, or what have you.

JW When did the existence of the acetylcholine receptor, for instance, become known? Obviously people must have postulated its existence.

AB Well, it was postulated at the beginning of the century that there had to be something with which drugs were interacting in order to produce an effect. The ideas

about the structure of the receptor remained really very primitive until the seventies. So it's very recent and I claim to be a pioneer of that.

JW Right, good, and that was some of the work that you were doing in your particular unit.

AB Yes.

JW Did you actually work out the fact that there were five sub-units in the receptor, as well?

AB No. Well, I worked on the muscarinic receptor; the muscarinic receptor doesn't have five sub-units.

JW No of course it doesn't, the nicotinic of course.

AB No. I worked on the muscarinic mainly because I had always been interested particularly in muscarinic action. And so I worked out the first methods of measuring the concentration of receptor and its properties. We didn't ever get round to isolating it, we tried very hard but didn't succeed, and others got there first on that.

JW But that was one of your principle fields. Now, you have said that you changed course on a number of occasions in you research. Did you change course in other directions too, in this unit?

AB Oh yes, I mean one of the directions that I changed course there was to develop nuclear magnetic resonance as a method for studying molecules of both drugs and receptors, and that was new. I'd spent a short time at Harvard learning the method and came back and set it up in Cambridge, and gradually developed it to a fairly sophisticated level.

JW Now, you had you held the chair for nine years and then along came presumably the invitation to go to NIMR [National Institute of Medical Research]. That must have come directly through council. Of course, you'd been on council, hadn't you, from '69 to '71 for two years, and then we met and served together on council, you'd gone back again some two or three years later?

AB That's right.

JW Was it John Gray or was there a committee that was established, there must surely have been?

AB There was a committee established and the invitation, of course, came from the chairman.

JW Of course, indeed. Who had been your predecessor?

AB Gosh, I'm terrible on remembering names at the moment, you know.

JW Never mind. But anyhow, you move to NIMR in 1971.

AB Peter Medawar.

JW Peter Medawar. Of course it was Peter Medawar.

AB Poor Peter Medawar had a stroke and had to give up.

JW I remember, right. When you went there did you feel at once that you were moving into a major going concern that was an exciting research and academic environment, or did you at once feel that there were certain things you needed to change?

AB Oh, I at once found there were things to change. It in some ways had lost its way. And I think the NIMR at that time was in a very difficult position because if you think of when it was set up, it was I mean the real centre of medical research in the UK. But since then, particularly since the war, medical research has developed tremendously in the universities and the universities had great advantages. They had space, they had posts and NIMR was a restricted environment. The council had decided it should not grow and so there was a very difficult problem of how to reform an organisation while it was in a *status quo* so to speak. It was an interesting job.

JW Were you on council at the time that the decision was made to establish the clinical research centre at Northwick Park or was that before?

AB That was just before I came on council.

JW Because that has been an unfortunate and sad tale. I remember very well that we were each of us involved in many discussions about it. Turning to your work at NIMR, and again I must ask you to be quite frank, what do you think your major achievements were in that institution?

AB I think I had only really a marginal effect on the institution, I would say. I don't think I produced a revolution in it which I would have liked to have done. I think it was just too difficult. Part of my remit was not to move in any big way in to what was the major new force in medical research namely molecular biology, because council didn't want another LMB set up there. So that was an inhibiting factor which meant to some extent one had to concentrate on organ physiology and biochemistry. It had been a great institution in immunology under Peter Medawar but most of the people had left so there was a rump there. So that was a very difficult task indeed. I think I did bring to it a new attitude towards molecular medicine without it mimicking what was going on at LMB. But I regard my period there as only a partial success, not one of the great successes of my life. My own division there I think was very successful. I brought the unit that I had here, which effectively became a division down there, and did very good work and has continued to do very good work since I left.

JW Looking back, if you'd been the supremo would you have established the National Institute of Medical Research out on a limb, as it were, as a free-standing institution?

AB I think it was a grave mistake. I mean, you know the story that the MRC decided to set up such an establishment and they didn't know where to do it. And there were lots of jealousies in London and Henry Dale was really given the opportunity to decide, that is the move from Hampstead, and he used to take walks out to Mill Hill at the weekends and he'd seen this farm out there and he said, 'It's a good place to put it.' But I think it was a bad place and the reason it was a bad place, it was separated from academic life in London.

JW That's right, and the same is true of the Clinical Research Centre. If only that had been built alongside a major teaching hospital with a very powerful link to a university, and again that was the problem.

AB Well, I'm sure that was it, and it was one that you couldn't really get over.

JW Looking back upon your days at the MRC, your two periods of service and of course your involvement in other things - you were chairman of the tropical medicine research board for four years after leaving council - are there any particular memories and highlights that stand out in relation to your MRC service?

AB I enjoyed the tropical medicine board enormously and it gave me a great zest for travel and I felt that we were really doing something very useful there. It was a curious thing, you've probably done the same thing, but to go out to the tropics is like taking fifty years step back in time in medicine; you go back to seeing the medicine that was in the text books that one discarded early on. But you felt that there was something that could be done there and I got very interested in what was going on. And of course I had tropical medicine at Mill Hill, parasitology divisions there, and so I had an interest in what was happening both ends. Now, that was a very important and interesting part of my time with the MRC.

JW Were you involved, as I was, with that long weekend where we spent the three days over the weekend at Park Crescent interviewing those who were aggrieved about their failure to get tenure.

AB I did indeed, yes. I think tenure is still an important question.

JW It still is, isn't it? What do you feel about it yourself? Do you think that the idea that's being introduced of limited tenure for university posts is right?

AB I think we are given tenure too early, but I would like to see when people are established, who have established themselves in research, they're given tenure very promptly. I think the American system of holding untenured positions for a long time is not a good idea. I think, mind you, the very best people don't care whether they've got tenure or not.

JW No, because they always get jobs. Turning to your fellowship at the Royal Society, of course you were elected FRS in 1964 in your early forties. You became a vice-president of the Royal Society in '80 for about six years and you were foreign

secretary for about five years. Each of these must have been interesting and important tasks.

AB Well, of course, it's enormously flattering to become a fellow of the Royal Society and I had never dreamed in all my life that I'd ever become a fellow of the Royal Society, so that was a wonderful day. As far as being officer and vice-president is concerned, that was absolutely an incredible experience. It's a great organisation and to play a major part in running it, because as foreign secretary you were an officer who took part in all the major decisions. But in addition I was concerned with all the international relations, and again I discovered that I really like travel and I liked foreign parts and especially got involved with the Far East and the relations with China, Japan and India. I think that's the most interesting job I've ever done, being foreign secretary.

JW Recognising that of course, that I have just been talking to a past president of the Royal Society [Sir Andrew Huxley], what does the vice-president do, or the vice-presidents?

AB Well the vice-presidents don't do very much is the answer. I mean they're technically there when the president is away to chair committees. But it's a very honorary post unlike being the foreign secretary, which took me two days a week.

JW Oh did it, as much as that, I see. If you were looking at the Royal Society from outside, recognising its enormous international prestige as probably one, if not the leading one, of the most important bodies in science in the world, is there anything in retrospect that you would like to change?

AB No, I think it's an organisation that's changed remarkably since I've known it. It was rather dead twenty five years ago and it grew up, and it particularly grew up under the presidency of Lord Todd and started to become involved in the life of the country and in scientific life in the world in a way it hadn't done for a period since the war. And since then it has continued to develop that way and I think it's without any doubt a leading force in science in Europe as well as in the UK, increasingly giving advice to government on scientific issues, which it didn't do in the early days. So I've seen it as a very flexible organisation. I mean, despite its age and venerability it adapts to anything that needs to be done.

JW And of course it's made vastly important contributions through its research professorships and its research fellowships in making it possible for really outstanding people in science to be supported.

AB I think the research fellowships particularly have been important because these have been a way for providing good posts for very bright young people with security for up to ten years, and the people who apply to it are absolutely marvellous people. I mean we have the greatest difficulty in selecting them because they're so good. I think there are roughly two hundred of these now and I think that's been a tremendously good influence.

JW The Society, of course, gets grants from government specifically to do certain things, like research fellowships and research professorships as well, but from what other sources does it derive its income?

AB Well, it has got some endowment and I think it's around twenty per cent of its finance from endowment. It's got a certain amount of work it does on contract. So somewhat over half the money comes straight from government.

JW Turning for a moment then to totally different matters. It is interesting when I said we were both born in the same year, we both married in 1946 and that was regarded I suppose in your day as being very young for a doctor. Was your wife in medicine?

AB She was a nurse.

JW She was a nurse at the Middlesex?

AB No, actually at the Central Middlesex, on my rotation.

JW And you have two sons and a daughter. Have any of them gone into medicine or science?

AB No, no. No science at all.

JW No science at all, curiously.

AB The oldest son is a psychologist, the younger one is a journalist, and my daughter is an artist.

JW I see, right.

AB The mother's influence was stronger than father's.

JW Any grandchildren.

AB Yes, five grandchildren.

JW So have we.

AB One doctor at least, one third year medical student.

JW Coming back then to your scientific and other honours, you were president of the International Union of Pharmacology for three years. What did that involve?

AB Well, the main purpose of the International Union of Pharmacology is to organise the international congresses. So it meant chairing a committee that looked after various things related to international pharmacology, but particularly was concerned with organising conferences and so on.

JW Around different parts of the world.

AB Yes.

JW I see, and was the congress in Britain at the time that you were president?

AB No, actually the congress in Britain came after I was president. I was president of the congress but I wasn't president of I U Phar. The congress that came round when I was president of I U Phar was in Finland, in Helsinki.

JW In Britain, where did you hold it?

AB In London.

JW In London. Because one of the problems nowadays is finding a good location in London for a major international congress.

AB We held the first major conference at the Barbican Centre. Not an ideal place. It's a very confusing place.

JW Absolutely, yes. A lot of people now are turning their eyes towards the new Birmingham conference centre, I gather, which is extremely good. Another major responsibility was that of being on the National Biological Standards Board. What did that involve?

AB I think, you know, that the Biological Standards were set up at Mill Hill. This was the story of Henry Dale going to a meeting discussing the first standards for insulin, and he tells the story that various people had said, 'Well, we think there should be a rabbit unit or a rat unit.' And he says that he listened to this for a while and he said, 'But rabbits and rats differ, what you want is a standard.' And he said he took out of his pocket an ampoule of insulin that had been prepared at Mill Hill and said, 'There's the standard.' And this is how the International Standard Organisation was set up and because he'd taken the initiative it came to Britain.

JW It took off. But then the National body... well, I see it had an international as well as a national.

AB So the lab was at Mill Hill and there was a board that was a government board associated with that, and during the time I was there the decision was made to create a separate National Institute of Biological Standards and Research, so it became detached.

JW Your involvement with the British Council again from '73 to '77, in what capacity were you involved?

AB On the Medical Committee.

JW You were on the Medical Committee?

AB I was chairman of the Medical Committee.

JW It's done a tremendous job. Again looking at its major contributions, what do you feel that they have been over the years?

AB Well, I think again, mainly in the way of organising medical conferences.

JW Fellowships, travelling fellowships.

AB Travelling fellowships to a limited extent.

JW And what do you feel the impact has been of the ELBS, the English Language Book Service - the cheap books for overseas countries?

AB I really don't know. My own textbook of pharmacology went in the ELBS, but I don't know what influence it had.

JW Well, I think it's probably been a way of bringing medical textbooks to people.

AB They were certainly very cheap.

JW Now another organisation about which I'm totally ignorant, where you were involved for five years, is the European Science Foundation.

AB Yes, The European Science Foundation which is in Strasbourg is an organisation of the research organisations of all Europe, the Council of Europe members, and I was one of the British representatives there. It's an interesting organisation that organises study groups and study programmes of various kinds, has very little money, because the research councils don't want to let it have very much money, so it's marginal in that sense. Its most recent activity which I applaud strongly is setting up Euro conferences on various subjects rather like the Gordon conferences in the US. These have been a great success and are funded by the EEC. I think it's a very good body. I think it's one where the research bodies from all of Europe can get together and talk about their problems and put together joint actions. And its notable joint actions, the European Geotraverse is one, in which a geological study was done carrying across all frontiers which couldn't be done otherwise. A deep sea-drilling programme is another very interesting one. Nearly all physical programmes, I'm afraid.

JW Well, turning to physics, they're not involved presumably with the expenditure of big sums of money as the SERC [Science and Engineering Research Council] is, spending money on CERN [Commission Européenne pour la Recherche Nucléaire]. I mean that is a different issue, that's a different procedure entirely.

AB Yes, the ESF, that did not have money. I mean its total funds were a couple of million a year.

JW Now, the other thing that fascinated me was your presidency of the Academia Europea since 1988. What is that?

AB Well, that's an interesting thing. This arose when I was foreign secretary of the Royal Society. Peter Brooke, who was then the junior minister in education, went to a meeting of the education ministers of the twelve and made an off-the-cuff remark that it would be a good idea if there was an Academy of Sciences for Europe. And he got such strong support from his fellow ministers that he came back to the UK and came along to the Royal Society and said, well, would you look into it. As I was the foreign secretary, I got the job. And we started with some scepticism but I found my European colleagues were very convinced that this was a good idea and so that's how it started. It started in the Royal Society. The idea was an Academy of Sciences originally for Europe, that is a Royal Society for Europe, but as we moved on two important things came up: one is that science in Europe includes the humanities and the social sciences as well as what we call science in this country, and secondly there was a strong feeling that Europe should be the whole of geographical Europe, that is including the Communist countries as well as Western Europe. So those two things have gone into it and we've developed very rapidly since then. We now have twelve hundred members right across Europe. We hold major conferences - our next one is in two weeks time in Budapest. We've got some interesting study groups. The first one reported just about two months ago on school education in Europe - a comparative study, very interesting indeed. Because, you know, we always think that our problems are our own problems and everyone else has no problems with their education, and you start comparing across Europe and you see that everyone has problems, not necessarily the same problems

JW Has that been published?

AB It's been published.

JW I would very much appreciate a copy because of my chairmanship of the current national commission on education.

AB I'll send you one, right away.

JW I'd like to have that, very much so.

AB And we've continued with that, we have a study on problems of youth, particularly the criminal problems of youth, which again you probably have an interest in, which is in its final stages. It will come out as a book at the end of this year. We're just starting a study of old age with your friend Bill Hoffenberg who is the chairman of the group, and so on. So we've got a wide range of activities. The most interesting recent one that's just about to take off, is a study of the accession of Eastern countries to the European Community, an independent, badly needed study.

JW It's remarkable the queue of countries that are waiting to join.

AB This is being based in Florence in the European University Institute at Florence.

JW Well, that's very illuminating. Listening to what you've said about the Academy do you think we need in Britain an Academy of Medicine of the kind people have been

floating from time to time? I must say the Royal Colleges fulfil many of its functions and so, to a certain extent, does the Royal Society of Medicine. But what do you think?

AB Well, I think we've almost got too many organisations in medicine, I don't think another one...I could wish away we had so many, and it was an Academy of Medicine but you can't turn back the clock on that, I don't think.

JW No. Your involvement with Ciba must have given you great pleasure because that foundation I think has made major contributions to medical science.

AB Yes, particularly to education. I mean, their series of reports are wonderful. I'm delighted that I'm a trustee of Ciba.

JW Is that an indefinite appointment with which you'll be continuing for some years?

AB I think eventually I reach an age limit, as one does with most things of course - a few years to go yet.

JW Well, coming back of course to Cambridge, were you surprised to be invited to become Master of Darwin in 1982.

AB Yes, I was. Frankly, I decided to leave Mill Hill when I was sixty. I didn't need to, I could have gone on until sixty-five. I decided eleven years there was long enough, and I didn't really know what I was going to do after that. And there were a lot of things going on at that time - possibilities. I made arrangements to come back to pharmacology here and have a research group here, which the MRC had been very generous about supporting for me. But I'd been used to doing other things. The year before I came back I became foreign secretary [of the Royal Society] and I couldn't have done that if I'd continued at Mill Hill. I could only do that in the context of knowing I was coming to an end. And then I was approached about two colleges here, in fact, and very much surprised about it. I came up to Darwin and liked it very much and did really as I'd done all my life, take something on without examining too closely what it was about.

JW Darwin is different though isn't it, from many of the other Cambridge colleges? Tell me about it.

AB Darwin was the first entirely graduate college and it was set up by Frank Young, who was the first master. And it was set up on an informal basis from the very beginning. It was a mixed sex college and had a very large number of people from overseas. And it was the foreign element of it that interested me - somewhat over fifty per cent of the students are from overseas. And so I rather like the informality of it. My Canadian experiences have made me a much more informal chap than before I went and I found that Darwin was of the same kind. So I enjoyed it very much.

JW In that respect I suppose it has, although it's much older, it has a resemblance to Green College, of which I was warden. Because there again the informality of that is what greatly attracted us. When was it established?

AB It was established twenty-eight years ago.

JW And there have been other graduate colleges since then, have there?

AB Yes, Clare Hall is a graduate college which is different because it has a lot of post-doctorals, and there's Wolfson, which is a bit like Wolfson in Oxford - not the same...

JW Of which you are an honorary fellow, I understand?

AB I am an honorary fellow. But Wolfson here also has undergraduates, so it's a mixed one. So really Darwin has remained the pure graduate college, if you like, in Cambridge.

JW Presumably named after Charles Darwin.

AB Yes, but Charles Darwin had nothing to do with it; it was named Darwin because it was set up in a house that belonged to the Darwin family.

JW Well now, it's interesting because I have just read for the first time a book that I should have read before, that was 'Period Piece - A Cambridge Childhood' by Gwen Raverat. So that refers to that particular house?

AB Absolutely to that house. It was George Darwin's house, that is the astronomer who was the son of Charles Darwin, and the family had it from then on.

JW One interesting difference between Oxford and Cambridge is that, of course, all the Oxford heads of houses are nominally at least full-time, though they're all expected to do other things as well, but in Cambridge they mostly hold other university appointments. But that's not true of Darwin is it?

AB Yes it is. I mean they're all part-time really. I spent a couple of hours a day in Darwin, that's all, and had plenty of time to do research and to also be foreign secretary of the Royal Society and do a few other things as well.

JW Were there any particular highlights of your time at Darwin that you would like to draw out?

AB Well, I think perhaps the best contribution I made to Darwin was setting up the Darwin lectures, which have been a tremendous success. These are a series of eight lectures given each winter term and which have appeared in books and we are now on the seventh or eighth series of these, and they draw enormous crowds of people from the town.

JW Where do you hold them, in Darwin itself?

AB No, we hold them in the largest lecture theatre we can get in the university.

JW And just out of interest of course, some of the formalities of the older Oxford and Cambridge colleges, I think some people find a little forbidding in the sense of the high table and the head of house's wife not being able to dine. But was Darwin a college of that kind?

AB No there is no high table.

JW No high table, and the same with us in Green College too. And your wife could presumably join you for dinner at any time.

AB Any time, and so could the wives of any member of the college, not just fellows.

JW Well, that again is a striking similarity. Arnold, it's interesting just looking at other things that you've done; your recreation, interestingly is listed as sculpture. Have you been doing that for years or is it a recent interest?

AB No, I started doing that when I was in Canada and I had lessons in the Museum of Fine Arts in Montreal, and enjoyed it very much. I've had gaps from time to time when I've been too busy to get on with it and then gone back to it again.

JW Now, is your sculpture traditional or more avant-garde.

AB Bit of each. I mean some of it's portraiture and some of it's abstract.

JW And with what materials do you work.

AB Mostly with clay - modelling.

JW I see, and is this something that you are now continuing in your alleged retirement?

AB I have been doing it in the last year, I'm not doing any just at the moment.

JW But are you still now, since retiring from Darwin, are you still involved in pharmacology and in research at all?

AB I'm not doing any research, no. I'm pretty busy as you can imagine. The Academia Europea takes a lot of time and I'm still involved in university committees of one kind or another.

JW Oh are you. So that is something that can happen, even after you given up as a head of house.

AB I have been until recently Chairman of the Board of Biology B which is the pre-clinical department and I'm still Chairman of the Board of Veterinary Medicine.

JW I see, right. I have only just recently met James Wright, who of course has left Cambridge and gone to my former University of Newcastle.

AB A great loss.

JW Well, I think he's going to be a great success.

AB He's a very able man.

JW A very able man, and we're very glad indeed to have him. If you were to look back over the whole of your professional life, would you do it all in exactly the same way again? Do you have any regrets or any unfulfilled ambitions?

AB That's a terrible question actually. I mean, my instincts have always been chemical. If I really went back again, I would have gone into chemistry not into medicine, I suspect. I think the thing that I regret about myself is that I get too interested in new things and I do something novel and original and then I lose interest in it and get something else. So I've in fact - people know me as all kinds of scientist. I mean amongst the secretorial people I'm known as a secretory physiologist, and I finished with that twenty-five years ago. So I suppose I've been a bit too much a Jack of all trades, and maybe if I'd concentrated more, I might have achieved more.

JW I think you've achieved a very great deal. And going back, there's a word which of course has achieved an unfortunate connotation - when people talk about designer drugs they often mean recreational drugs - but surely one of the great things in pharmacology has been that drugs have been designed on the basis of the biochemical and pharmacological knowledge.

AB Yes, but I'd have loved to have understood why they were the way they were, we still don't.

JW Levodopa?

AB I don't think there is any drug, one really understands why it does what it does when you get down to the fundamentals. If you talk about drug receptors, we know quite a bit about drug receptor's structure now, but we have really still very little idea of why one receptor responds from one drug rather than another.

JW I see.

AB I'd love to know that before I pass on.

JW Even though you're not involved in research, no doubt you're going to continue with your interest in pharmacology. And being as active as you remain, I'm quite certain that we shall be hearing a lot more of Arnold Burgen in the years to come in a whole series of different capacities.

AB I hope so.

JW Well so do I, and it's been a great pleasure talking to you. Thank you.