

AUDIO INTERVIEW TRANSCRIPT

Aronson, Jeffrey: transcript of an audio interview (25-Apr-2016)

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Biography: Dr Jeffrey Aronson DPhil FRCP HonFBPhS HonFFPM (b. 1947) trained in the University of Glasgow (1964-1973) and the Medical Research Council (MRC) Unit and University Department of Clinical Pharmacology, Oxford, under the late Professor David Grahame-Smith. He was Reader in Clinical Pharmacology at the University of Oxford, and Honorary Consultant Physician in the Oxford University Hospitals Trust until 2014, since when he has held honorary contracts as a Consultant Physician and Clinical Pharmacologist in Oxford. He was President of the British Pharmacological Society (2008-2009) and is now Emeritus President. He was Vice-Chairman of the Medicines Commission (2002-2005) and Editor-in-Chief of the *British Journal of Clinical Pharmacology* (2003-2007). He has been Chairman of the British Pharmacopoeia Commission's Expert Advisory Group on Nomenclature since 2006. He was a Member of the Formulary Committees of the *British National Formulary* from 2006 and the *British National Formulary for Children* from 2003, and is now a Member of the Advisory Board of the *British National Formulary*.

TT: Tilli Tansey

JA: Jeffrey Aronson

TT: Could you say, to begin with, a little bit about your family background and your early education? Was there science and medicine in your family? Why did you become interested in developing a career in this way?

JA: I was born in Glasgow in 1947, an only child, and in my father's family (they mostly lived in Glasgow) there was no science whatsoever. Their father had died when my father was 14, or about that time, in the worldwide pandemic of influenza in fact. So my father, who would actually have been about 13 or 14, had to leave school and earn a living for nine children in the family, with his elder brother. There was no opportunity for them to be better educated, and the whole family went into business of some sort. So there was nothing on my father's side. My mother, however, came from Liverpool and her twin brother was a General Practitioner [GP], quite an eminent GP in Liverpool, as was his wife, and they ran a practice with four individuals, the two of them as senior partners and a younger man and a younger woman. So I think that the stimulus to me to become a doctor came from my mother. In fact, I do not remember a time when I did not want to be a doctor, and I'm sure that that was from her. I do remember on one occasion wondering about other professions and discarding them all because I couldn't see any advantages to them. But it was pretty much inculcated into me at a very early age. So I grew up in Glasgow and I went to a school called the 'Glasgow High School', which was the equivalent, I suppose, of an English direct grant school.

There were fees but they were pretty nugatory. And I had a very good, broad education there, so that when I came to sit O levels and then the Scottish equivalent of A levels - called 'Higher Exams', which in those days were about one year short of the English A levels, but which nowadays I suspect are as good as, or

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perhaps better than English A levels currently - I was able to take six subjects: three sciences, Maths, Physics, and Chemistry; and three arts' subjects, English, Latin, and Greek. And that was enough to get me offered a place at Glasgow University to read medicine. So I left a year earlier than I might otherwise have done, and was 17 when I went into Medical School. It was a six-year course, which is why I decided to leave a year early from school, instead of going on and taking further subjects, because it seemed to me a long time to be spending in university. I went through the university course without any great upsets, and emerged in 1970 as a qualified doctor. Now at that stage, in those days you didn't decide what you wanted to do. You did preregistration house jobs; nowadays that's called 'Foundation' and you do two years. In those days we did one year, six months general medicine, six months general surgery. I did my general surgery with a very good general surgeon called Mr McKay, Hugh McKay, at the Victoria Infirmary, and I did my medicine with an equally good physician called Sam Lazarus at the Southern General Hospital. That was very good, they were very good times, and I had good colleagues who were very helpful and friendly and we had good working relationships.

I then decided that I wanted to be a Clinical Pharmacologist. That was very unusual at that time, because you would do your house jobs, you would then look for a SHO, Senior House [Officer] job, and there were broadly speaking two ways you could go. You could become a GP; about 50% of my colleagues did that. Or you could stay in hospital medicine and become either a physician, a surgeon, or a laboratory doctor, and then you could subspecialise in any of those areas. Well, I knew that I was cut out to be a physician in hospital; that's what I wanted to do at any rate. And you did that, you decided on that course pretty early on, reasonably early on, but you didn't decide on your specific specialty until considerably later, maybe until you were a Registrar or even a Senior Registrar. It took quite a long time for most people. But I decided early on, and the reason was that the idea again was planted in my mind, this time by a colleague. It happened because I came home from the university one afternoon just after our results had been published in the final year, and a neighbour of ours across the road, a man called Jake Davidson who was a Radiologist at the Western Infirmary, saw me and hailed me and came across to congratulate me on my results. My father had already been spreading the word around town. So he said, 'What are you going to do?' So I said, 'Well, I've got house jobs and so on.' And he said, 'Yes, yes, but what specialty are you going to take?' I said, 'Well, I haven't really thought about it.'

And then he asked me, I think, a very important question. He didn't ask me what I favoured, what my greatest interest was, which one would generally do. He said, 'What was your best subject?' And that was quite clear, it was what we called '*materia medica*', which was a very ancient subject in Scotland. It was the study of medicines and their actions and it went back at least over 100 years, or 150 years, and it's what we now call 'clinical pharmacology'. I said, 'Well, that's my best subject, *materia medica*. I got a distinction in the exam and it was very interesting.' I did find that very interesting, although I find all of medicine very interesting, actually, and I could have chosen anything really. I hadn't really thought about it. And his question, 'What was your best subject?' - not 'What was your favourite subject?' - that made me think. He said, 'Well, that's a big subject at the moment. You should go and read the editorials in the journals.' I said, 'I didn't know that.' So I went away, I looked at the *British Medical Journal* [BMJ], I looked at *The Lancet*, and sure enough there were editorials there talking about clinical pharmacology as an up and coming subject. I then found that the Royal College of Physicians in 1969, just the year before, had set up a working group under the chairmanship of Cyril Clarke, who later became President of the College.

They had produced a report on the future of clinical pharmacology. And in 1970 the World Health Organization produced a report on the future of clinical pharmacology. So I got hold of these reports and read them and thought, 'Yes, that's it. That's what I want to do.' It was quite clear.

TT: Amazing, isn't it? Can I just go back a little bit, Jeff, and ask you about your schooling? Did you have any particular inspirational teachers to do science? Because you have this interesting mix and it comes up throughout your CV; because there's the writing and the arts interest, so you do three science subjects, three arts' subjects. You didn't do Biology?

JA: No, we didn't. Biology wasn't a subject available to us in those days; the sciences were Physics and Chemistry basically, and of course Mathematics went along with those. I didn't have any inspirational science teachers. They were all rather dull. Well, not all of them. There was one teacher who was very ebullient who taught us Chemistry but he was amusing and entertaining, not really inspirational. Our Physics teacher was deady dull and it wasn't until I took an extra subject at O level, which was called 'Applied Mathematics', that I started to understand Physics, because that's what applied mathematics was in that course. And I really began to understand it because we had a very good teacher. But again, not inspirational. Inspirational teachers, if there were any, came on the arts side actually, people who taught us Latin and Greek and English were really quite inspirational and very interesting. I guess that I was already set on a scientific course from wanting to be a doctor, so having the arts inspiration was an addition that stimulated that side of things. I didn't need inspirational teachers in the sciences, whereas having inspirational teachers in the arts was very helpful.

TT: And what about at university, because you say that your best subject was *materia medica*. Did you have any sense at the time when you were a student, 'Oh wow, this is really exciting,' or was it later when you started looking at these reports?

JA: I don't recall a feeling of excitement. I was interested pretty much in everything in medicine. Whenever I took a new subject I'd find whatever it was interesting. The whole broad sweep of medicine was interesting and that actually is important to being a Clinical Pharmacologist because you cover the waterfront of medicine, and if you're not interested in everything, you'll miss a lot of what is relevant in clinical pharmacology. I don't remember being excited. I do remember just being very interested, and why medicines in particular interested me I really can't say. I have no idea. I just found that this whole subject was utterly fascinating. The textbook we had at that time was called '*Dilling's Clinical Pharmacology*'. There were two clinical pharmacology textbooks. One was Lawrence's textbook, which I think was largely used by English students, but Scottish students were encouraged to buy Dilling's textbook, which was an Edinburgh textbook. It had originally been called '*Materia Medica*' and had been first published I think in the middle of the 19th century. But in 1960, the new 20th edition was called '*Clinical Pharmacology*'.

And it was a pretty dull book actually. Lawrence's textbook was full of jokes, full of pictures, very lively. Dilling's textbook was solid text, fact after fact, no jokes, terribly dull. But I read Dilling's textbook half a dozen times during the course and I just thought the subject was fascinating and I can't tell you why. Why is anybody turned on by anything? I don't know. But that's what really turned me on. And of course, as you imply, later on one does become excited, one learns about what goes into making these things, how drugs are made, how they act, what their targets are, and so on. That is actually very interesting and exciting, because you learn that there are things that aren't known. But as a medical student that didn't occur to me, and I suspect it's true of many medical students, or students at that stage. You don't understand that what you've being taught is not dogma, that there is still a lot to learn, a lot that's unknown. You accept what you're told and you regard it as absolute truth, and it's only later on that you realise that that's not the case at all.

TT: Did you particularly select house jobs and positions with the idea of becoming a Clinical Pharmacologist?

JA: Well the house jobs didn't matter, in a sense. You got what job you could. In fact most of my colleagues had arranged their house jobs in their fourth year of six and I, as usual, was rather dilatory. I hadn't done anything about it until the final year. I got my medical house job because I'd been a student on Sam Lazarus' firm and he'd given me the top certificate among the students at that time. And so I went to him and asked him if he had a job and he said, 'Oh no, we're full up. All the jobs are taken.' He said, 'I'll put you on the waiting list but it's unlikely.' And a week later he phoned and said he had a job, so I guess he bumped me up to the top of the list and somebody fell out. I then met one of my colleagues, who was also going to work with him and I told him that I was going to work in Sam's unit and he said, 'That's great. What are you doing for surgery?' I said, 'I don't have a job.' He said, 'Go around to the Victoria now. There is a spare place in Hugh McKay's unit.' So I went straight round to the Victoria and spoke to McKay and he said,

‘That’s fine.’ And in those days you just went and said, ‘Gizza job’ and that’s pretty much what happened. Because the house jobs were not regarded as being important from the point of view of one’s career, you just had to do the preregistration job and get it over with. I was very lucky because I fell into these two jobs which were really excellent, with good colleagues and enjoyable surroundings. Everything went very well; we were exceptionally lucky, I think. Luck plays a huge part in everybody’s career and people don’t always acknowledge it, but I was exceptionally lucky with those house jobs.

But after that I started thinking about clinical pharmacology and I went to see Abe Goldberg. Abe was Professor of *Materia Medica* by that time.

TT: In Glasgow?

JA: In Glasgow. I’d known Abe two years before, when I was a final year student on his firm in the Western Infirmary when he had a titular professorship, Professor of Medicine, there. And when Stanley Alstead retired, who was the Professor of *Materia Medica* with laboratories on the premises at Stobhill Hospital, Abe got the job of Professor of *Materia Medica* as it was still called in those days. Now it’s called ‘Clinical Pharmacology’. So I went to see Abe. I’d known him already from being a student on his firm and I said I wanted to be a Clinical Pharmacologist. We chatted about the future and so on. At the same time I went to see people at the Middlesex Hospital in London. Now this had happened because in my final year the Nuffield Foundation had offered Glasgow students bursaries to go and study whatever subject they were next due to study at the Middlesex Hospital or maybe at other hospitals, I’m not sure, but we were sent to the Middlesex. And this announcement, this offer of funding to Glasgow University was with very short notice. Instead of advertising it, the Dean at Glasgow picked half a dozen or so students he thought might be interested and invited them along to his office to ask whether we would be interested in going to London.

I was quite surprised that most of my colleagues weren’t interested. I think they felt that if they did that they might prejudice their chances of passing the final exam for some reason. But I was due to do surgery, and I wasn’t particularly interested in surgery and I didn’t mind much where I studied it. The prospect of going to London for three months really turned me on. So three of us went down and spent some time at the Middlesex Hospital, where we got to know the staff there, and particularly the Dean of the Medical School, who was an anatomist. I think his name was Wall, but I’m not sure. He was a Scotsman. I got to know him quite well and when I graduated I wrote to him telling him that I’d passed, that I was on my way through London, and that I’d call in and see him. So I called in to see him and he asked me what I was interested in, and I said I was interested in a career in clinical pharmacology. So he introduced me to the Professor of Pharmacology at the Middlesex, a man called Franz Hobbiger. Hobbiger was a specialist in cholinergic pharmacology of the parasympathetic nervous system. I met Hobbiger and he offered me the chance to do a PhD with him in Basic Pharmacology. I thought that was quite a good idea, it would be good to get a grounding in the basic science. The only disadvantage of that was that it paid a non-clinical salary, but I didn’t mind that; I thought it was important to get some proper training.

So I went back to Glasgow and spoke to Abe again and told him what had happened. He said, ‘Yes, that sounds like a good idea, why don’t you do that?’ So I was about to write to the Middlesex [Hospital] and tell that yes, I was interested in taking part in this enterprise and doing a PhD with Hobbiger, when the postal strike happened. Tom Jackson and his Union went on strike. Now of course there was no e-mail, there were no faxes; there was telephone but it had to be a written application and so I delayed sending in my letter to the Middlesex. And in the meantime Abe got in touch. He said, ‘I’ve been thinking about this.’ He said, ‘I don’t think you should do it.’ He said, ‘I think you’d be much better advised to get a general medical job, do your postgraduate training for Membership of the Royal College of Physicians before you consider specialising.’ Well, I was very disappointed at that, because I had my heart set on going down to London. Having spent 25 years of my life in Glasgow, I thought it was time to branch out and see what the rest of the world did. So I was very, very disappointed in this advice, but I knew, I knew, that it was good advice. I could see that he was absolutely right.

And so when the strike was lifted I wrote to Middlesex saying I was sorry, I decided that I wouldn't come. And instead I applied for a job as an SHO in Stobhill Hospital, which is where Abe was working. And he encouraged me to do that and they interviewed me, and it's the only interview I've ever had for a job actually. And I got the post. And that was a three-year appointment: two years, supposedly two years, as an SHO and the third year you would be a Registrar provided you'd passed the Membership exam. The two years as an SHO were in four month chunks, doing various medical specialties and some subspecialties like dermatology and psychiatry. So I got a reasonably good training in various specialties, in cardiology, in endocrinology and so on, different areas that different firms covered. And before the two years were up I passed the Membership of the College and then decided that I ought to look around for jobs in clinical pharmacology. Now Abe's plan for me was that I would do that with him, but I was still keen to go to London. And so I went down and had a look around. Now the other part of this story, which had happened simultaneously with all this, was that an old school friend of mine, Murray Macbeth, who was one of the brightest in the year that I came up with at school, had come down to Oxford to read for a DPhil in Philosophy. Kant was his subject and he wrote his Thesis on Kant. And I'd come down to visit him, just to see what it was like. And I thought, 'Wow, this is a fantastic place. Afternoon tea on the lawn, punting on the river, studying in an Oxford college. Isn't this wonderful? What a marvellous place it is.' So I said this to Murray and he said, 'Well, why don't you come too?' I said, 'Oh, don't be silly.' I said, 'There's no way that the Medical School will take me here. It's okay for you, you got a first class MA and you're studying philosophy. But medicine's not like that. There's no way I'll get accepted in a place like this.' He said, 'Come on, why don't you go and see, have a look?' So I made an appointment to see the Professor of Medicine, the Nuffield Professor, who was a man called Paul Beeson. Beeson was an American physician. In fact looking at your shelf up there I see Beeson and McDermott's *Textbook of Medicine*, which was originally a Cecil Loeb's textbook, but was later edited by Beeson and McDermott. Well, Beeson came to Oxford to be the Nuffield Professor of Medicine. Lovely man, delightful, very good scholar in the old American tradition. And I made an appointment to see him, and I told him I wanted to be a Clinical Pharmacologist, and did he have a job as an SHO? He said 'No.' He said, 'Do you have your Membership?' I said, 'No.' He said, 'Well, we don't have SHO jobs for people who don't have their Membership.' I thought that was a bit odd and I don't think it was strictly true, but that was his story. Then he said, 'But the MRC is going to fund a Unit of Clinical Pharmacology in a year or two. So go away, get your Membership and write to me again.'

So there was I on the trail of a job in clinical pharmacology, probably in London I thought, but I thought I'd keep Oxford open as an option. So I came down to London, I saw Colin Dollery at the Hammersmith, who didn't hold out any prospects for me. I saw Paul Turner at Bart's and he suggested that I'd like to do a PhD with Peter Quilliam who was the Professor of Pharmacology at that time. And I think I saw Desmond Lawrence or I may have missed him, he may have been away, at UCH [University College Hospital]. And I don't remember anything coming of that, or even a promise. But then I came through to Oxford and I saw the new Professor of Clinical Pharmacology there, David Grahame-Smith. David had been Reader in Clinical Pharmacology in St Mary's under Stan Peart, and had been appointed to the new Chair of Clinical Pharmacology in what was a joint arrangement between the MRC, the MRC Unit, and the University Department of Clinical Pharmacology. In fact the MRC funded 90% of everything, the Rhodes Trust funded David's Chair, and the University gave us premises, so very little was actually funded by the university. I told David that I wanted to be a Clinical Pharmacologist and we talked about it, and he discussed the work that was going on in his department. And he said, 'Well now, it's April.' (This is April 1973). He said, 'It's too late for you to apply to the MRC for a Research Fellowship, but if you're willing to wait until next year we can apply in March for a Fellowship starting a year in September.'

I said, 'Well, I have a job.' I'd just got the Membership, I had another year or a year and a bit to run. I said, 'I don't have to be in a rush so I'll let you know.' The work he described really turned me on. I was very interested in the particular work he described that they were doing on a group of drugs called 'cardiac glycosides'. I was interested in cardiac glycosides because I'd worked with a man called Brian Whiting in Abe Goldberg's unit, who was working on cardiac glycosides, and I thought that the work that Brian was doing was very interesting, but didn't really get to the heart of the problem. I didn't know how to get to the heart of the problem. All I knew was he wasn't doing it in a way that really, I thought, would be the way to go, but I didn't know what the way to go was. When I heard David describing what they were doing I was

totally switched on, because what he was describing was the answer to my question. How would one get to the heart of this problem? And to put it in technical terms, Brian had been taking a pharmacokinetic approach and David took a pharmacodynamic approach. Rather than looking at where the drug was, David was looking at what it was actually doing and choosing a surrogate marker of action. That seemed to me really, very exciting.

You asked me before 'did anything excite me?' That was the first thing that really excited me, when I heard David describe the work they were doing. So I went back to Glasgow and I wrote immediately to him saying, 'Yes, I'd love to apply for a Research Fellowship in his Department the following March, and I was very interested in the work on cardiac glycosides that he was doing.' Because most of the rest of the work was to do with 5-HT [5-hydroxytryptamine; serotonin] and psychopharmacology, which didn't interest me so much. Well, within six or eight weeks I got a letter from him saying, 'If you'd like to start in September, I've got a place for you.' Again, it shows how lucky you have to be, because a man called Arthur Hibble who had been with David at St Mary's, had come with him to Oxford, was doing the work on cardiac glycosides, had decided that he wanted to give up academic medicine and become a GP. Arthur had left, and the post that he held was open to someone interested in cardiac glycosides, which is what I had expressed an interest in. So David offered me his post, Arthur's post, to start in September as an employed member of the clinical scientific staff of the MRC.

TT: At this stage were you still thinking of doing your DPhil? Because there seem to be two things here, there's your clinical career and then, there's this underlying tension almost about doing scientific training.

JA: I knew I had to get some kind of scientific training if I was going to be a specialist in clinical pharmacology. I thought that was hugely important. I recognised the value of Abe Goldberg's advice that I ought to get the clinical training, the basic clinical training, out of the way, because otherwise it would have been very difficult for me certainly, maybe not for others, but certainly it would have been difficult for me, to have gone away to do a basic science training and then come back to do the clinical work. Whereas if you get the clinical work out of the way, get your postgraduate qualification, in my case Membership of the Royal College of Physicians, then you can come back to it at any time. Particularly in clinical pharmacology, because when I came back to doing clinical medicine after a three- or four-year break to do basic science, the main thing that had changed during that time was the drug therapy. Everything else was pretty much the same. So by virtue of being trained as a Clinical Pharmacologist, I had kept up-to-date with the therapeutics, and that was the thing that had changed most in the time that I was away from clinical medicine. So I didn't suffer any difficulty in catching up, I was already up to speed because that was my specialty. The only other things that really changed in a major way were the investigations, laboratory and clinical investigations, such as radiology, and one had the support of laboratory staff for that.

But the general medicine, on the whole, although there were changes of course, but on the whole the changes were not as dramatic as the changes in drug therapy, which I had kept up with. So I'm sure that that was the right thing to do, but all the time I was keen to get both the clinical and scientific training, because I thought that was hugely important. You had to understand both sides in order to work effectively as a Clinical Pharmacologist, and I think that was something I recognised from the reports that I had read about how clinical pharmacology was developing. Looking at what Clinical Pharmacologists were doing, looking at their research profiles, how they worked, what their set ups were - and I'd gone to look at the London units, for example - that was all clear. But clinical and research activities went hand in hand. So it was clear to me that that was important, that I ought to do both and take care of being trained as a scientist as well as a clinician. And I don't think I could have found anyone better to train me than David Grahame-Smith. He was a biochemist in effect. He had done his MD Thesis on a very, very basic piece of biochemistry, describing the existence of an enzyme that nobody had described before, tryptophan hydroxylase. His biochemistry background and his training in science was very useful in training me to be a pharmacologist in the clinical setting.

TT: So when you have this amazing opportunity to go to work with David Grahame-Smith in Oxford in the September rather than waiting till the next March, what were your responsibilities? Did you have clinical responsibilities or was it purely a lab job?

JA: It was purely a lab job to start with. David had a weekly outpatient clinic, but it wasn't until later that I took part in that. But he also arranged for the clinicians in the department to go on ward rounds with other physicians. So I was attached to one of the three clinical firms that were in Oxford at that time. David himself was a Consultant Physician on what was called the 'NDM', the 'Nuffield Department of Medicine', where Paul Beeson was the Professor, and his successor later was David Weatherall. That was David's attachment. Our Senior Registrar, who was Frank Woods, who later went on to be Professor of Clinical Pharmacology in Sheffield, was attached to the second clinical firm, and I was attached to the third clinical firm, which had Peter Sleight, Professor of Cardiovascular Medicine, Donald Lane, a chest physician, and Jim Holt a general physician, on it. And so I used to go twice a week to do ward rounds with them, to advise supposedly on the drug therapy, wet behind the ears though I was. But that was very good training; going round, doing ward rounds with those physicians was really very informative and very helpful. And so I kept in touch with clinical medicine, even though I wasn't doing any clinical medicine myself. And on one occasion I was asked to do a locum under John Ledingham, who was on one of the other firms, and I did that without any difficulty, and that was most enjoyable for two or three weeks.

And then, later on, I was asked to do another locum for one of the Senior Registrars who had taken leave to do a sabbatical, and I was asked to fill in. So from time to time I did have a chance to be doing practical clinical medicine, but most of the time, up to, certainly up to 1980 when I became a Consultant, I was doing research in the laboratory.

TT: Could you say something about the research, Jeff? This was all on the cardiac glycosides?

JA: Yes, that's where it started, although it developed into more physiological research eventually. The main cardiac glycoside that was used in those days, and still is but much, much less so, with more modern drugs taking its place, was a drug called 'digoxin'. Digoxin was first described properly, I should say, in 1785, by a Birmingham physician called William Withering. Withering had described how he used foxglove, which is where digoxin is found, although the foxgloves he used contained different cardiac glycosides, not digoxin, how he had used foxglove to treat what he called 'dropsies', namely 'collections of fluid in the body', some of which would have been due to cardiac problems, but not all. And Withering's description is actually very good. He shows that the drug is good for cardiac dropsies and not for other types of dropsy. The cardiac glycosides fell into disuse for the next 100 years, or so, because people didn't understand or appreciate how to use them properly, and they were rediscovered by James MacKenzie in this country and, Karl Wenckebach in Holland, and used to treat what they in those days called 'auricular fibrillation' - what we now call 'atrial fibrillation', an abnormal rhythm in the heart - and very effectively.

And then John McMichael, when he was Professor of Medicine at the Hammersmith in the 1930s, showed that digoxin was also useful in the management of heart failure, even when the heart rate was not irregular as it is in atrial fibrillation. And so, for many years, digoxin and other cardiac glycosides in this country - primarily digoxin - had been used to treat both atrial fibrillation and heart failure even when the heart rate was not irregular. But there were problems with it, and a major problem was that it was difficult to use because a dose very slightly more than was effective, was toxic. So the balance between finding an effectively therapeutic dose and avoiding toxicity was very, very narrow. It was a tightrope. Furthermore because the drug was eliminated by the kidneys, and as you get older, your kidney function deteriorates, the response to the drug could change quite markedly as you got older and it could be quite difficult to use as your kidney function deteriorated. Changes in dose would need to be monitored. The third problem was that the drug was often used with diuretics - drugs used to get rid of fluid from the body and they would do this by getting rid of sodium and potassium at the same time - and losing potassium made you more sensitive to digoxin and so you might easily develop toxicity if your diuretic caused potassium loss.

So there were real problems with this drug, and at that time it was the only drug available for treating atrial fibrillation certainly, and to some extent heart failure. So people had tackled, or tried to tackle, this problem by measuring plasma digoxin concentrations, because they thought that the amount of drug in the plasma would be a good reflection of the amount of drug in the heart, and that therefore you could titrate the dose to get the best effect while avoiding toxicity. And that was what my colleague, Brian Whiting, had been doing in Glasgow when I became interested in this question. He'd been measuring plasma digoxin concentrations using a radioimmunoassay which had been developed in the States in the late 1960s by a man called Tom Smith and his colleagues. And it seemed to me that that was useful, yes, but the drug was mostly in the tissues, not in the plasma. Only a very tiny fraction of the drug is in the plasma. And it seemed to me that just measuring the concentration in the plasma as a measure of how much was in the heart was really taking a stab in the dark, a shot in the dark at what was really going on. You couldn't really know how much was in the heart just by measuring the amount in the blood. Actually as it turns out it's not a bad measure, it's better than you might expect, but it seemed to me it still wasn't anywhere near ideal, and that there ought to be a better way of doing this. And what David was doing, what David Grahame-Smith was doing, was to measure the action of the drug rather than just the amount.

Now ideally you'd want to measure its action in the heart itself but that's difficult and you couldn't do it non-invasively with any great ease. So David had developed a method based on the mode of action of cardiac glycosides. Now the cardiac glycosides work by inhibiting an enzyme in cell membranes. It's called the sodium/potassium ATPase [Na^+, K^+ -ATPase; ATPase: adenosine triphosphatase]. And they inhibit the enzyme, which is responsible for transporting sodium out of the cell and potassium into the cell. And by measuring the rate of transport of potassium into cells you can measure how well the drug is working, what it's actually doing at its site of action, at its target. Again you'd like to do that in the heart, but you can't get the Na^+, K^+ -ATPase from the heart. But there is an easily obtained source of the enzyme and that is on red cells, erythrocytes. So what David was doing was taking patients' erythrocytes and looking at how much ATPase function there was in those red cells as a surrogate marker of the function of digoxin in the heart. And so he set me to study that problem and the question was: would measurement of ATPase activity in red cells be a better marker of the actions of digoxin than plasma concentration measurement? It turned out that it was, again not ideal, because it's at a distance from the real site of action, but it's closer than just measuring the amount of drug; you're actually measuring an action on a tissue, even though that tissue is not the one you'd like to be measuring.

And so we did a lot of work on studying the ATPase, first of all in red cells and later in other cells, typically white cells in the blood, and then in experimental animals as well. And a thing that we discovered that nobody had described before, which was really exciting, was that when you gave digoxin long-term, you saw it inhibiting the pump, the ATPase, to start with, but then after a week or two the ATPase function would start to recover even though the drug was still there. And then, there would be a struggle between the drug and the ATPase and there would be fluctuation in the ATPase activity as it tried to recover and the drug kept on trying to pull it back down. ATPase tries to recover and the drug pulls it back down. There will be fluctuation of this sort until after a few weeks the pump, the ATPase, would win and ATPase function would return to what it had been before you introduced the drug, even though the drug was still there in the same amounts that it had been from the start. And this observation was a central interest of David's, not only in relation to cardiac glycosides but to all other pharmacological, adaptive responses to treatment. And people now talk about up-regulation or down-regulation of receptors in response to changes in the function of those receptors. And this was a very early demonstration of what was happening in terms of this enzyme, which one could regard as a receptor for cardiac glycosides.

So from that, we went on to study the mechanisms whereby these adaptive responses occurred, and so from being a pharmacologist I became a physiologist studying the function of Na^+, K^+ -ATPase in cell membranes, and we did quite a lot of experiments looking at stimuli that alter the function of the ATPase and thereby cause it to up-regulate in response to inhibitory or other stimuli that alter its function. And that went on for... well really until David retired in 2000. We did all that work in various ways, looking at mechanisms of adaptation of, in my case the Na^+, K^+ -ATPase and in David's case, other functions in the brain relating to 5-HT and other neurotransmitters.

TT: Did you have much involvement with other people in the Unit, the 5-HT people and the psychopharmacologists?

JA: Yes, I did, particularly with Richard Green, with whom I shared an office for many years. He was interested in 5-HT, its synthesis, its action, and how it was abnormal in mental illness and how drugs used to treat mental illness, for example antidepressants, might affect its function. And I did some work with Richard bringing my clinical pharmacology background to bear on his pharmacological interests. What we did, some of the work I did with Richard for example, was to look at the pharmacokinetics of tryptophan. Now tryptophan is a precursor of 5-HT and you can measure its plasma concentrations after oral therapy, and by measuring how the plasma concentrations change with time, you can model the distribution and elimination of the drug from the body, and make conclusions about where it's going and what's happening to it. And you can then use drugs that interfere with that disposition and make conclusions about what's happening to the enzymes and the tissues, or its disposition, either metabolism or clearance or whatever. And so we published a series of several papers on tryptophan kinetics, making conclusions about the metabolism of tryptophan in relation to 5-HT and its action in mental illness.

TT: You were a member of staff of the MRC Unit? Did you have much interactions with other Departments, with University Departments, say Physiology or in Pharmacology?

JA: Yes I was. We didn't have much interaction with Pharmacology. They were two separate Departments, Pharmacology and Clinical Pharmacology. The Chair in Clinical Pharmacology was funded by the Rhodes Trust and it was instituted at a time when Bill Paton, who was Professor of Pharmacology at that time, was also Chairman of the Rhodes Trust. And Bill, I think, was very instrumental in bringing that Chair to Oxford with the MRC's funding as an MRC Unit of Clinical Pharmacology. But after that, we had very little contact with the Department of Pharmacology, certainly in terms of research on the clinical side, although there was later some collaboration with basic research, and several years later we collaborated on studies in Alzheimer's disease. But we did have contact with them in terms of seminars. We used to run joint seminars, and those were very useful, and I met people like Hugh Blaschko, for example, who although he was retired by then, used to come to all the seminars and always had something interesting to contribute. We had almost no connection with physiology, except occasionally with Clive Ellory who was Reader in Physiology at that time and was interested in the Physiology of Na^+, K^+ -ATPase, and so it was natural that I should go and discuss the work with him. But we didn't actually ever do any collaborative research, although later I did collaborate with some of his colleagues, and did publish a paper with Clive and others, but that was much later.

We did however have a lot of connections with clinical Departments. I did a lot of collaborative work with Peter Sleight and his colleagues in the Department of Cardiovascular Medicine. David did a lot of collaborative work with the Department of Psychiatry, with Michael Gelder, who was the Professor in those days. We did some collaborative work with the Department of Neurology and particularly Neurosurgery, because we were interested in the pharmacology of subarachnoid haemorrhage. And so there were connections, and I also did some collaboration with the nephrologists, with John Ledingham and Tony Raine, because I was interested in Na^+, K^+ -ATPase function in renal impairment, as it appears that there is something in renal failure - a dialyzable substance that inhibits the Na^+, K^+ -ATPase - and so we did some work with them. And the way those collaborations occurred was generally by importing Registrars who were working in those Departments and who wanted to do further research, usually for an MD degree, and who would come to our Department to do research on drug therapy that was relevant to their specialty. So, for example, I did a lot of work with Nick Boon, who was one of Peter Sleight's Registrars, and then went on to be a Consultant Cardiologist in Edinburgh. And Nick and I did a lot of work on Na^+, K^+ -ATPase in hypertension.

We had Psychiatrists coming to the Department, obviously because of David's interest in 5-HT and Richard Green and so on, but I worked with the Psychiatrists as well, because there was a story at one time that Na^+, K^+ -ATPase might be abnormal in depression. And so people like Andrew Woods, who was a

Psychiatrist-in-training, and others, came to the Department and did research on ATPase function in depression. And we developed a method for studying ATPase activity *in vivo* by looking at the kinetics of a potassium substitute, because if you study how potassium is disposed around the body most of it travels *via* the ATPase, and if you look at its disposition you can make conclusions about ATPase activity. I also did work with the nephrologists, looking at ATPase function in renal failure, and so we had a lot of collaborations. One day a man called Azad Khan came to the Department. He worked with one of the senior Gastroenterologists, Sidney Truelove, who was very well known in Oxford. Sidney invented what was known as the 'Five Day Regimen' for treating ulcerative colitis, a very effective method for treating acute severe ulcerative colitis. And Sidney was interested in the aminosalicylates, which are very effective in the management of ulcerative colitis, and he sent Azad Khan along, a Bangladeshi doctor who had come to work with him and was doing research, to ask my advice on how to design a pharmacokinetic study.

I advised him about that and we went on to study the pharmacokinetics first of all of sulfasalazine, and later of another aminosalicylate called 'olsalazine'. And nowadays these drugs, particularly mesalazine, are mainstays in the management of ulcerative colitis, and we did the very early work on the pharmacokinetics of those compounds. And that was because they came to ask us, asking advice about the clinical pharmacology. So there were lots of opportunities for collaboration with other clinical Departments, much more so than with the preclinical basic science Departments, partly because we were known in the Clinical School as clinicians going on ward rounds, teaching the medical students, taking part in the grand rounds, and partly because, well, the science area was geographically a little bit away from where we were, so there were fewer opportunities to meet and collaborate.

TT: This seems to be, from what you're saying, an incredibly fertile period. You also did your DPhil during this period?

JA: Yes. I enrolled as a graduate student in Corpus Christi College, which at that time had as its president Kenneth Dover, who was President of the British Academy, a great Greek scholar and a fascinating man. And being a Member of a College at that time, I thought, was a great opportunity to meet other people, not just scientists but people from the humanities like Dover and others. And so I enrolled in Corpus as a graduate student and wrote up the early cardiac glycoside work as a Thesis for a DPhil in 1977. And all the early work that I'd done, for example the work on upregulation of the ATPase response to digoxin, was part of that Thesis.

TT: And then in 1980, towards the end of 1980, you moved from the MRC Unit. You became a Consultant with the Health Authority, is that right? This is not part of the University?

JA: Well, it is and it isn't. I came to Oxford in 1973 on a three-year contract. After three years the MRC renewed my contract, which gave me six years. And at that point it would have been normal MRC practice to appoint me to a tenured post. Scientists who were basic scientists after six years, pretty much got tenured posts without any fuss at all. In those days it just happened automatically pretty much, not quite, but it was expected. But there was I, six years as a clinical scientist. I'd spent 10 years of my life training to be a doctor, wasted as far as the scientists were concerned. Perhaps that's a bit unkind [laughs]. So I was 16 years on from qualification; no, I'm counting from 1964 so I had six years medical training where a scientist would have had three years, so that's an extra three years wasted, if you like. And then four years training, three or four years training to be a doctor, so quite a long time spent in ways that scientists would not have spent, would have been working hard at the science, which I did not have. So my six years of training as a scientist were not regarded as being sufficient qualification for a tenured post, which is not unreasonable. But the MRC were very generous and they said, 'We'll give you another three years and at the end of that period we'll see what's happened, where you are, and if you are ready for a tenured post with the MRC.' So that took me roughly to 1979, and at that time the Wellcome Trust announced its Senior Lectureship scheme. I think it was Peter Williams who started that.

His idea, and the Trust's idea, was that at a time of retrenchment and financial difficulty in universities, the Trust was willing to fund posts that would not otherwise be available, for five years in the first instance, on

the understanding that the university would take over the post at the end of that time. But without - and I think this is a lesson that the Trust learned, not just in medicine, but in history as well - without actually getting a firm agreement from the universities that that would be done. I think the Trust thought that it would choose people of such stature or ability that they would automatically get Chairs of some sort at the end of the five years, or before too long anyway. So they didn't take the precaution of getting a firm commitment from the universities, and most of us who won those awards at that time, did not go on I think straight away to become Professors, because we were enjoying the research too much and didn't want to give up the opportunities of doing research that we wanted to do in exchange for the administrative duties of a Professor. I think we were a very unusual group of individuals, but then we were chosen by the Trust because, I suspect, we were unusual in that way or in some ways.

So I applied for one of these posts and was awarded it. Actually the story of how that happened is quite interesting, I think.

TT: Please tell us.

JA: I applied for the post, one of these Wellcome Trust Senior Lectureships. They had appointed six the previous year, five or six the previous year, and this was the second round and there were six more to be had, and I don't know how many applicants. Quite a lot I suspect. So I came up to the Wellcome Trust to be interviewed. Bill Paton was on the interviewing panel, Edda Hannington who was a lovely woman, a doctor in London, whose specialty was migraine, a neurologist from Queen's Square, Professor Roger Gilliat, and I can't remember who the others were.

Bill Paton chaired the panel, and it was clear that he was the only one who knew what was going on as far as my work was concerned; the others were just, I don't know whether they'd read the papers, probably not, and they didn't understand the work. Gilliat asked me a couple of questions which made it clear he hadn't a clue what was going on. Edda Hannington was delightful, but one wouldn't expect her to understand the pharmacology. She was a very good clinician. And Paton was the only one who asked me any questions that were of interest to me in terms of the work I was doing. And from the start we got on to the wrong foot because, and I didn't appreciate this, Paton along with Humphrey Rang had invented the techniques that I was using for doing receptor binding. But the ATPase was not a common, not a usual, type of receptor; it was very unusual, and unusual in one particular regard, which was that it very specifically bound digoxin to almost the exclusion of everything else. And Paton was used to systems which were very difficult to work out, in which the nonspecific binding was very large. The receptors he was used to dealing with had very low level of specific binding and very high levels of nonspecific [binding], whereas my system had no worries of that sort.

Now I didn't realise that, because to me the system I was using was pretty straightforward and I really thought this was old hat actually. I didn't realise how relatively new it was, because it was David Grahame-Smith who had introduced me to the idea, and he was up-to-date with all the latest research. I hadn't appreciated how very new it was. Anyway, Paton and I got onto the wrong foot because he thought there would be high nonspecific binding and I knew that there wasn't. And we debated this for five minutes before I realised what he was getting at and told him exactly what the specific and nonspecific binding was. And he only understood after this long debate, because I hadn't appreciated what he was getting at. It was my fault [laughs]. So anyway I went out of this interview and I went back to Oxford and David said, 'How did you get on?' I said, 'David, it was absolutely terrible. It was really bad. I got on to the wrong footing with Bill Paton. He didn't understand what I was doing, I failed to explain it properly. I really made a total mess.' He said, 'Well, never mind. There'll be other opportunities.' So I went on holiday after that for a couple of weeks. We went down to the south coast with my in-laws, my wife who was pregnant, and we had a lovely time. And I'm sitting reading the newspaper one day and I look down the column 'University News': *'The following have been awarded Wellcome Trust Senior Lectureships: J K Aronson ...'*

I looked at it and I thought, 'My God! That's incredible.' I thought I'd totally, totally screwed it up. And I went rushing upstairs and said, 'Look! Look! Look!' I phoned back to Oxford and they said, 'Where the hell

are you? We got the letter last week, we wondered where you were. We can't reply.' So that was how I got the Wellcome Trust Senior Lectureship. Now Oxford of course didn't have Senior Lecturers. It had Lecturers, Readers, and Professors, so the title that was agreed was 'Wellcome Lecturer in Clinical Pharmacology'. And later when the University gave me a Readership and the Wellcome Trust scheme was for Senior Lecturers, I became known as the 'Reader in Clinical Pharmacology (Wellcome Lecturer)'. Nothing about my title actually reflected what the Wellcome Trust has given. That was for five years. And the scheme in those days was to apply after three years for renewal, so you always had a two-year buffer. So after three of your five, you would apply for a further five, and then after a further three or whatever, yes, you'd have had eight, three already plus five to come. You'd apply again always with a two-year buffer to allow you to get another job in case you weren't re-appointed. The first three-year review was just a written report and that went straight through and the lectureship was renewed. And then after another three years I was called up for another interview, and the same thing happened. It was a different panel, but it was clear they didn't understand what I was doing [laughs]. It was very bizarre.

And I went out feeling really quite annoyed actually at that point, because I'd already been through that process once and thought that I'd screwed up because the questions were not pertinent or because of misunderstanding, and it happened again. Questions were not pertinent or relevant to what I was doing. But they renewed the post and so I went for 13 years on a Wellcome Trust Senior Lectureship until the Wellcome Trust said, "That's enough. We can't keep on funding you forever. The university will have to take over." And at that point the University found funds and gave me a tenured post. But I went for 20 years in Oxford with funding, first from the MRC and then from the Wellcome Trust, before that happened in about 1993.

TT: You also have your clinical responsibilities. How did that come about and how did the two go together?

JA: Right. Well, as I said before, I had been doing clinical work from time to time on an *ad hoc* basis, filling in for people when they were on sabbatical or whatever. So I'd done some Registrar work, I'd done some Senior Registrar work and, I should say, you asked me before if this was an NHS [National Health Service] or university appointment, the Wellcome Trust appointment was funded by the Trust, employed by the University with an honorary contract from the NHS. And so at some time or other, it must have been in the early 1990s, I can't remember exactly, 1993 or thereabouts, David Grahame-Smith said to me, 'The on-take physicians,' which is the group of physicians who do the acute general medicine, 'needs a physician to fill a gap,' because Roger Chapman I think it was, who was a Gastroenterologist, had decided to stop doing general medicine and become a full-time Gastroenterologist, as often happened with specialists. They would do some general medicine, but general medicine is pretty busy and time-consuming, and it gave them less time to take care of their specialty. So Roger had decided he wanted to do gastroenterology full-time, and so there was a gap in the on-take physicians rota. Would I fill in? So I said, 'Yes, okay.'

So I became one of the on-take physicians and I did that from then until I stopped doing it about four or five years ago when I was about 65, I suppose.

TT: So this covered your MRC period and your Wellcome period?

JA: No, this started during the latter part of the Wellcome funding but was largely after that, when the university found me a post. And one strong reason for doing it, for becoming not a full-time clinician but doing as much clinical medicine as I did, was that the funding that the University raised came from the Regional Health Authority as was. This was money that a woman called Rosemary Rue had raised some years before. Rosemary was Chief Medical Officer in the Regional Health Authority, as it used to be. Her successor, I think, was Alex Gatherer. And Rosemary was very, very keen on getting university and NHS together. She raised funding, I think for 20 posts, 20 half-time I suppose, or even full-time posts, in the University to be funded by the Regional Health Authority out of NHS money in order to foster good relationships between the university and the NHS. And so my post was then funded by money from that budget. This is from about 1993. So from 1973 for seven years I was employed by the MRC. Then from 1980 or thereabouts I

had 13 years with the Wellcome Trust, and so in 1993 or thereabouts I was funded from the 'Rosemary Rue Fund', let's call it, until I retired, funded by the NHS but on an honorary contract, and employed by the University.

TT: You had honorary positions whilst with the MRC?

JA: Yes, throughout my time in Oxford, David Grahame-Smith organised whenever he could for all the clinicians to have honorary positions in the NHS, so that they could go on ward rounds, advise, do clinics and do all the things that a clinician might want to do even while they are doing research. So I had an Honorary Registrar contract when I first came and then an Honorary Senior Registrar contract. And when I became a full-time Consultant, although I was employed by the University, my contract was an honorary contract with the NHS; what was then called the 'Oxford Area Health Authority' and then later the 'Oxford Radcliffe Hospitals Trust'.

TT: When you moved from the MRC Unit, what were your research objectives?

JA: Nothing changed really. All that changed was the source of funding, and I applied for the Wellcome Trust Senior Lectureship on the basis of the work that I had been doing with the MRC. So as far as my research was concerned, it was pretty seamless. It was the sources of funding that changed.

TT: And did you still have lab facilities?

JA: Yes, absolutely. Yes indeed, I had laboratory facilities with David all the time that he was there, from 1973 until he retired in 2000. And all the work that I did in the laboratory was with him and with people who came and went as part of their attachments to the Department, usually doctors doing MD degrees.

So people that I mentioned before, for example, Nick Boon, who stayed with us for three or four years, Andrew Woods, likewise, Chris Brearley, Azad Khan, who didn't actually work in our Department but collaborated with us. All the people you will read who are names on, collaborators on my publications, apart from people like David Grahame-Smith and Richard Green, were people who came in, either came into the Department to work for a fixed period of time, or were collaborators who worked with us.

TT: Do any of those collaborators in particular stand out in your memory or were a particularly enjoyable collaboration, or the converse?

JA: Well, we had good relationships with all those with whom we worked. It was really a very productive and enjoyable time. I particularly enjoyed working with Peter Sleight. He had a very fresh approach to science, although not himself a scientific researcher. He'd done some scientific research in the clinical sphere, but he was full of insight into physiological mechanisms, understanding of how science worked, even though he didn't himself do a great deal of scientific research, and it was really great fun working with him and he used to give us people to collaborate with. So I particularly enjoyed the collaboration with him, and used to go on his ward rounds. I enjoyed learning a lot from him about clinical medicine in general, and cardiology in particular. That's one that sticks in my mind as being a really enjoyable and fruitful collaboration. But we had good relationships with everyone. I enjoyed working with Sidney Truelove, who was a lovely man. And again, although not a trained scientist, had great insight into the scientific process in relation to clinical medicine. Michael Gelder was enjoyable to work with, although I didn't collaborate with him directly, but he was very supportive of our Department and his collaboration with David Grahame-Smith was very fruitful. So yes, I wouldn't say there was anybody we didn't get on with in our collaborations. They really were very enjoyable.

TT: Did you ever find any tension between your clinical career and your lab career? Did the two meld together?

JA: I managed to make them meld, and again I think I've been very fortunate in that in those two separate careers neither made excessive demands on me. When I was doing my clinical work I was able to get on and do what I had to do, but at the same time take time off to go back to the lab and *vice versa*. So I never found any tensions between those two things, and in fact I found that one would feed off the other. I think that's very important: that there is crosstalk between clinical work and laboratory work, which can - if you use it properly - feed your research and feed your clinical activities. And there are among those publications on my CV, instances of cases that we wrote up that benefitted from scientific input into a clinical problem. So I always found the two complementary, and I think they should be. I think it's important that anyone who is a clinical scientist should be active in clinical medicine, because you get so many ideas from seeing patients and seeing their clinical problems, and *vice versa*. Your scientific expertise can bring information into the clinical sphere that allows you to deal with clinical problems better.

TT: That was always David Grahame-Smith's adage as well.

JA: Absolutely. In fact there were times when I felt that David pushed it too far. For example, he gave up some very nice premises in the Radcliffe Infirmary that we could have had because he wanted his laboratory to be closer to the wards. Now I'm not criticising that, but that was the strength of his feeling that the two should be very close together, so much so that he wanted them to be geographically close, not just close intellectually. So that was something I learned from him very early on, that it was important to have the juxtaposition of those two things and crosstalk between them. I think that was an important lesson.

TT: What about the people in the Units who were not clinicians? Did they feel that somehow they were missing out? Did you get any sense that they were another kind of person in the lab, they weren't really working on the same kinds of problems?

JA: I never had that feeling in our laboratory. I don't know if it happens elsewhere and how scientists elsewhere feel or think about clinicians in their midst. I sometimes had the feeling that scientists elsewhere rather looked down on clinicians as being not very scientifically literate. That may have been a misunderstanding, but I never had it in our Department and I think the main reason for that was that David was such a good scientist. And it was clear to the clinicians, and to all of us in fact, that he understood science very deeply, and that meant that they respected him for his scientific abilities as a clinician, and I think that some of that rubbed off on the rest of us, whether we deserved it or not. But I think that his leadership really made that an important facet of the Department. I never, at any time, felt that the scientists in any way felt that clinicians were inferior or different in any respect.

TT: You mentioned sort of these two parts of your career, or two careers almost, the lab scientist, the clinician, but actually that's just half of your career because you have lots of other attributes, Jeff. You write a lot, you edit, you publish a wide variety of things. I think probably going back to your Highers, the Greek and Latin, the 'When I Use the Word' series, all of this kind of work that you do.

JA: Yes, very much so.

TT: When did that start? I take it that's always been an interest? When did you really start getting into the idea of publishing some of these ideas?

JA: Well, I had always been interested in words, and my love of Latin and Greek reflects that, or was reflected in that. And I had for some time wanted to write about etymology and philology in relation to medicine, but I was put off by two things: one was that there was a man called Bernard Freedman who used to write the most wonderful articles in the *BMJ* on medical philology, whom I admired enormously; I felt that I couldn't match that. And the other thing was that I felt that it wasn't my subject really. I didn't feel that I was competent to do it. And so I held off. But Freedman stopped doing those articles and I started thinking that perhaps I might write an article or two on medical words. And we were on a ward round one day chatting to the students about a young man who'd had a fight with his landlord. And a week or so later he

came in with a subarachnoid haemorrhage and we did a spinal tap, we put a needle into his spinal fluid, and it was yellow, the fluid was yellow. Now normally the spinal fluid is what people describe as gin-clear. It's crystal clear, a beautiful, transparent, colourless liquid. And the fluid was yellow. Now this is a well-known phenomenon. If you bleed into the brain and the blood trickles out into the spinal fluid, it then breaks down and the haemoglobin turns the spinal fluid yellow. This is known as *xanthochromia* [ξανθοχρωμία], which in Greek means 'yellow colour' literally.

So we discussed the question, could the fracas that he'd had with his landlord have caused the subarachnoid haemorrhage? And the clue was in the *xanthochromia*. The timing was wrong. It takes time for the yellow colour to occur and the timing was wrong. It couldn't have been that he had a subarachnoid haemorrhage directly after the dust-up that he'd had. So we discussed this and then I said, 'What does *xanthochromia* mean?' So we discussed the meanings of the words and we talked *xanthelasmata* [ξανθελάσματα], which are little yellow coloured growths, around the eyes or elsewhere. And *xanthomata* [ξανθώματα] which you get over tendons, the Achilles tendon and the knee sometimes, and so on. And I said, 'Any others...' we talked about *xanthines* [ξανθίνες], so that gave me a chance to discuss theophylline and the treatment of asthma, and the *xanthines* are so called because they form a yellow colour when you react them with nitric acid. So all this was very interesting and we were getting into all kinds of areas of interest away from subarachnoid haemorrhage. Then I said, 'Any other words?' and one of the girls said, 'Ah yes!' she said, '*Chrysanthemum*?' [Laughs]. I said, 'Right, let's go back to the patient.' But it was an interesting error that she'd made. Anyway I thought, 'That's a funny story, I'll write it up,' and I wrote it up as a filler in the *BMJ* and they published it, they just accepted it without question. I called it '*Curious, yellow*' and I thought, 'Well, that was fun.'

TT: That was 1996.

JA: Yes, 1996, it's just 20 years ago, that's right. And so I thought, 'Oh, that was good.' The other reason I'd held off, I think, was that I thought that by writing about such trivial matters it would somehow sully my scientific reputation. When I realised I didn't have a scientific reputation [laughs] I thought, 'It doesn't matter!' That was very liberating. So I starting writing. I then wrote other things, and people started stopping me in the corridors saying, 'I did enjoy your article.' Nobody ever stopped me and said, 'I thought your piece in *The Lancet* on Na⁺,K⁺-ATPase in Alzheimer's disease was utterly fascinating!' Nobody ever said anything like that, but they did stop me and say, 'I enjoyed your piece on *chrysanthemums*.' So I thought, 'Oh, people are actually reading these things.' I got a letter one day from a physician in Hungary: could he use my pieces as translation exercises? I said, 'Yes, sure, of course, why not?' And I got letters from people saying, 'I enjoyed your piece on this, that and the next. When are you going to publish them in a book?' and so on. So I started realising that people were actually reading these pieces, and so I persisted and I suppose I've done about a hundred of them in the last 20 years or so. I did some at greater length and published them in a few other places, because the *BMJ* only allows you 600 words, now 300 in the print version.

TT: According to your CV, you've done 94.

JA: I've written some in the *Quarterly Journal of Medicine [QJM]* which are 1,200 word pieces, and occasionally I get invited by other journals to write articles. Alvan Feinstein for example, who was Editor of the *American Journal of Epidemiology*, wrote asking me to write one on 'percentiles' and the origins of the words that are used, and that takes you into work of Galton and others. So yes, that's grown, and now instead of writing occasional fillers in the *BMJ* I have a weekly blog, and I called it 'When I Use a Word' which is taken out of '*Alice in Wonderland*', of course; '*Through the Looking Glass*' rather. Yes, it's been very fruitful and most enjoyable actually, very enjoyable.

TT: You had already published a little bit in medical humanities by that time?

JA: Yes, a little bit. When I was writing my Thesis, my DPhil Thesis on digoxin, I thought I ought to do the obligatory historical chapter. You always write a bit about the history of your subject to get it into context. Now, in most cases for most Theses, that would be a very short chapter of probably not a great deal of interest historically; it might be, but generally not. But with cardiac glycosides the history goes back hundreds

of years, and so I had to delve into the history of the cardiac glycosides over quite a long period of time. And of course the major piece of history in that is William Withering's 1785 monograph '*An Account of the Foxglove and Some of its Medical Uses*'. And so I found myself researching 18th century medicine, which was something I'd been interested in in passing; I had always been interested in history. In fact at school history was one of my worst subjects, but the bit of history that I scored heavily on was history of science. I remember one exam where I got 50% for the exam, five questions, 20 marks each. I got 20 out of 20 for the history of science and I scraped a few marks together for all the rest. So I'd always been interested in the history of science, but again I felt this was an area that wasn't really mine, that it wasn't something that I was expert at, but I had to do it for the Thesis.

So I started researching the history of foxgloves, and I was very fortunate at that time to have met Charles Webster. I was doing my graduate studies at Corpus, and at that time Charles was a Fellow of Corpus, in fact he was the Librarian Fellow at Corpus. And I met Charles and started chatting to him about the historical work I was doing and Charles said, 'Send me your manuscript. I'd be interested to read that.' So I sent him my manuscript, the draft version of my chapter, and he invited me round to the Wellcome Unit for the History of Medicine in Banbury Road and he said, 'This is very good, you ought to publish it.' I said, 'Oh no, don't be silly.' I said, 'I'm not an historian.' I said, 'I've just, this is just my chapter for my Thesis.' He said, 'Oh, no, no, no, you ought to publish it.' Anyway, I didn't. I really didn't feel that I should, I didn't think that it was my place to publish in a field in which I was not regarded as member of the profession, as it were, a card-carrying historian, if you like. I think that was rather foolish perhaps, but that was my view. I didn't really feel, I didn't feel confident, that was the problem, that historians would look at this and say, 'Oh this is a useful piece of work', despite the fact that Charles had actually encouraged me to do it. And in fact while I was doing the research from that point on, I spent quite a lot of time in his Unit and I met all the people in the Wellcome Unit for the History of Medicine, and enjoyed their company. They were very helpful, exceptionally helpful. They would come in - I'd be there having morning coffee - and they'd come in and say, 'I was down at the records office in Plymouth and I found this, I thought you'd be interested in it.' It would be something about the use of foxglove in an area that I hadn't a clue about. It was really very helpful, very interesting.

So I'd done my research, I published the chapter in the thesis and that was fine, that was 1977. And some years later, well 1985 was the 200th anniversary of the publication of Withering's original monograph in 1785, and so I proposed to Oxford University Press a book on the history of the foxglove from that time, for the last 200 years, because I'd done quite a lot of work by then on the background to the development of cardiac glycosides, although the 19th century was a big blank at that stage. Anyway they accepted that as a proposal for a book and as an afterthought I said, 'And we can publish an annotated facsimile of Withering's original,' because I thought that my own contribution wouldn't be big enough to fill a proper volume and I thought it would be nice to annotate Withering's text, because I'd been reading it quite a lot. So they accepted that, and I published what we called '*An Account of the Foxglove and its Medical Uses 1785-1985*' and it begins with an annotated edition, a facsimile - I think the Royal College of Physicians lent us their copy to make a facsimile from - with marginal annotations explaining all the terms, explaining the use of the medicines and whatever they meant, who the people were to whom he was referring, all the botanists and herbalists and so on that he refers to, who wouldn't be well known. And then that was followed by my own history of the foxglove and its development over the years.

And I think the print run of that was something like 800 or so, not very many as a print run. It sold out and you can now buy it on Amazon for about £150 or 200 or 300, some crazy price, really.

TT: And wasn't that translated?

JA: It was translated into Spanish, yes. Oxford University Press got in touch with me. They said, 'A drug company,' I think it was Boehringer Ingelheim or it may have been Boehringer Mannheim, 'a German company, want to translate your book into Spanish. Is that all right?' And I said, 'Why do they want to?' And I realised they wanted to because Spanish is the second most commonly spoken language in the world apart from I guess Chinese, but of the Indo-European languages, English and then Spanish, because it's

spoken all over South America except for Brazil. And so I realised they wanted to print 3,000 copies, and just give it free all over South America and Spain. So I said, 'No, I don't think that's a good idea. I don't want my name associated with a drug company's advertising campaign.' So they came back to me and they said, 'Look, we've got an agreement from them that they won't put their logo on your book.' I said, 'Okay, fine.' So they published a Spanish translation, and I've no idea what happened to it. I have a copy but I have no idea. I suppose there are people in South America who have copies of it because they said they were going to print 3,000, which was much bigger than the original print run. But I've no idea what happened to that.

But it was on the strength of that book, I think, that I was later asked to join the Wellcome Trust's History of Medicine Units and Grants Panel, as I think it was then called. And I served on that for two three-year terms. It was Irving Loudon who had been my predecessor, and the panel wanted a token doctor on the panel and Irving suggested that I might be a suitable successor to him, which is highly flattering to me because he was a proper historian of medicine and had a well-deserved reputation. But I enjoyed serving. I served two three-year terms and then I was asked to stay on for another year in order to chair the quinquennial review of the Wellcome Unit for the History of Medicine in London.

TT: I remember it well.

JA: Which was fraught with difficulty.

TT: Yes.

JA: But a very interesting time.

TT: It must have been.

JA: So I met a lot of historians of medicine through that, people like Roy Porter, Bill Bynum, yourself of course and others. And that was fascinating, really very interesting. It taught me a lot about the practice of history of medicine, the academic practice in the history of medicine and the scholarship and so on.

TT: Do you think that doctors, practising doctors, have a role to play in the history of medicine?

JA: Oh, I'm sure they do. Traditionally, of course, it's the retired doctor who takes up history of medicine as a hobby, and that's fine; there's nothing wrong with that. Although in recent years, well, maybe the last 30 or 40 years I suppose, historians, medical historians, have become much, much more interested in the social aspects of the history of medicine, whereas the retired doctor is more likely to write the biography of the famous man or woman. And that has been a little bit frowned upon by academic historians. But I think it's important that younger doctors should at least take an interest in the history of medicine, and I'm very keen that they should be taught about the history of medicine. And perhaps even if possible undertake special study modules or maybe a bit of research in the history of medicine, because it's not just that it supports the subject - which is important - but it gives them a different outlook on clinical practice and for example, ethics, the problem of uncertainty and how to deal with it in clinical practice, and many other things are reflected in a knowledge of how people have behaved in the past.

So I think that they should at least be exposed to it and whenever possible encouraged to do some of their own research, perhaps as students or even later if they want to take sabbatical leave to study the history of their own subject - I think that's very useful. But I don't discount the elderly retired physician who writes an adequate biography of some great figure in history. I think that's just as important, even though the historians of medicine may have a rather different view of it.

TT: As well as your interests in your own writing and these broader interests in medical humanities and delving into the etymology, you've also been a very prolific editor of pharmacology *per se*. Would you like to say something about that? Because not everybody gets involved in that kind of work.

JA: Yes, well I am very interested in it partly because of my interest in language and the desire to see things well written, clearly written, because I think that communication is important, and clear communication can only be achieved if you understand how the language works, or is greatly helped, shall we say, if you understand how the language works. And that doesn't mean avoiding split infinitives or all those rules that the prescriptive grammarians adopt; I don't mean that. I mean writing clear prose that is instantly understandable by people reading it whether they are expert or not. So my feeling that that's important has to an extent fuelled my interest in editing, because editing gives you a chance to produce text that is clear, as clear as one can make it, from other people's text, which may not always be as clear, particularly if they are foreign-language contributors whose command of English may only be a little better than most English people. So I think that's been part of my passion about editing. But I came into editing *via Meyler's Side Effects of Drugs*, which has been a major task over many years, from a very, very peculiar angle, and it's a story I'm happy to tell you.

It started with a publication called '*MIMS Magazine*'. Now *MIMS*, which stands for the 'Monthly Index of Medical Specialties', is a paperback book, which drug companies corporately issue and send around to all prescribing doctors. I think they still do. As a Clinical Pharmacologist I used to receive it every three months, but GPs would get it every month, and it contains a list of all proprietary formulations available in the UK. It's a kind of massive advertisement for drug companies, in effect, but it's got a lot of useful information in it about the names of drugs and the doses and so on. And sometime or other, I can't remember when, sometime in the 1970s David Grahame-Smith received a phone call from somebody at *MIMS*, and he said, 'We're going to start *MIMS Magazine*. It's not for the little paperback formulary, it's a little magazine that contains articles about the drugs. Would you and your colleagues like to contribute?' So David said, 'Yes, okay, we can do that' and he asked me to write an article on diuretics. It was actually organised according to the way *MIMS* was organised, so it wasn't just diuretics, I had to write about antidiuretics as well. Now I knew absolutely nothing about diuretics, but it was a good learning exercise, a good educational exercise, so I looked it all up, I read about it, and I wrote my article. That was fine, it was published, I didn't think any more about it.

A month or two, a few months later I got a phone call from this chap who had been in touch with David to chat about the article. He said, 'We're having a lunch for our contributors, would you like to join us in London?' I thought, 'Oh, that's good, I'll swan off for a day, take a day off and have lunch in a posh restaurant in London.' I can't remember where it was, it was in a basement somewhere in the West End, a very nice lunch. And I found myself next to a clinical pharmacologist who introduced himself as Joe Collier. Now I didn't know Joe in those days, I'd never met him. I didn't even know what he did. We got chatting and 'What are you doing?' he said, I said, 'I'm working on digoxin.' 'Oh, that's very interesting,' he said, 'What do you think about β -methyl digoxin?' This was a new drug, it had just been marketed in this country. And as it happened - and again luck plays such an important part in all these stories, you can't manage your own life - I had been reading about β -methyl digoxin the day before, and I'd got out all the latest papers on it and I was reading about it. It was all fresh in my mind and so I gave him chapter and verse of this new drug. 'Terrific,' he said, 'Will you do me an article for the *Drug and Therapeutics Bulletin*?' So I said, 'Yes, sure, delighted.'

So I did the article and it was published in *Drug and Therapeutics Bulletin*. *Drug and Therapeutics Bulletin* was a very idiosyncratic publication. The method they used was that somebody like me, or whoever, would be commissioned to write the article, but then it would be sent to all and sundry, 30 or 40 people maybe, all of whom would add their comments. It would then be edited so that by the time you got the thing back it was nothing like what you'd written in the first place. So I'm not sure that what appeared in the *Drug and Therapeutics Bulletin* was what I had actually written, and it's anonymous, so my name isn't attached to it because it's a corporate venture, but there it was and I was very pleased with it and I thought no more of it until a year later I got a letter from a man called Graham Dukes asking me if I would contribute a chapter to the *Side Effects of Drugs Annual* on cardiac glycosides and antiarrhythmic drugs. And I said, 'Yes, I'd be delighted.' He said, 'And Brian Robinson recommended you.' I'd never heard of Brian Robinson, I didn't know who Brian Robinson was, but I looked into it and I found that Brian Robinson was a very good

colleague of Joe Collier's. And what had happened, I think, was that Joe had shown Brian Robinson my piece on β -methyl digoxin and on the strength of that, because I can't think of anything else, any other reason, although I had published stuff in the literature but that was the closest event, I thought that he'd suggested to Dukes that I might write the chapter on cardiac glycosides for the *Side Effects of Drugs Annual*.

Now the history of *Meyler's Side Effects of Drugs* is quite long and involved, but the *Side Effects of Drugs Annual* was an update, rather like the *Encyclopaedia Britannica's* annual update of the main encyclopaedia. Anyway to cut that story short, I went on contributing an annual chapter to the *Side Effects of Drugs Annual* and Dukes came along and saw me and said, 'Would you like to join me as co-editor?' I did, and when he dropped out I became the sole editor of the annual, and I then started editing the encyclopaedia that went along with it. All because - I think - because I swanned off and had lunch at a fancy London restaurant one day, just for the hell of it.

TT: Amazing.

JA: That's how these things happen. And we've just last year published the latest edition of the encyclopaedia *Meyler's Side Effects of Drugs*, which is in seven volumes now. And it's huge. It's something like 3.5 million words, 365,000 references, something like that. It's enormous.

TT: How many contributors?

JA: Well, that's an interesting question. I do the whole work for the encyclopaedia based on the work that's published in the annuals. In the annuals we have 50 chapters, each with one, two or sometimes three authors, so there's upwards of 100 authors in each annual, and it changes over the years as authors drop out and new authors come along. So, I guess, over the years we've probably had about 200, maybe 250 authors. I haven't counted them up, but I have the complete list and it's published on the web in the publisher's website, giving a list of all the contributors who have been there since the beginning.

TT: It seems to me to be an enormous job to take on, but it's only a couple of lines in your CV.

JA: [Laughs]. It is a big task. For the 15th edition, which was only six volumes, I had part-time assistants, but I found it difficult to get funding from the publishers for that. They want to make money yesterday and aren't keen to cast their bread upon the waters. And so, although I had a bit of help with the 16th edition, latterly I was doing it all myself. It is a huge job, yes.

TT: And you do other things, you've been Managing Editor for journals, and things like that? You've got at least three or four?

JA: Well, yes, perhaps not as busy as you might think. I was Managing Editor of the *European Journal of Clinical Pharmacology* for some years, but there were four of us, and we shared the work out. And there it's mostly a case of sending papers off to Referees, to Reviewers, and then making a decision based on their reports. Although I did, I have to say I did a lot of editing of manuscripts even then. One of our contributors once responded to my editing by sending me a red pen, because this was in the days before track changes and she thought I must have run out of ink [laughs]. But yes, and then I took on the managing, well it was called, latterly we called it 'Editor-in-Chief' of the *British Journal of Clinical Pharmacology*. But there was a group of Editors actually doing the work, and they had an Editorial Board under them who would send out the work to Reviewers, so there were layers upon layers. And the Editor-in-Chief in fact has a lot of help, and it's not very time consuming, I would say.

TT: One obvious further question is learned societies - the British Pharmacological Society?

JA: Yes, indeed. Well, I was Editor-in-Chief of the *British Journal of Clinical Pharmacology* in, I guess, 2002-2007 or thereabouts, something like that. And as I said, that wasn't very time-consuming, because the Editor-in-Chief has an Editorial Board under him of active Editors who have an Editorial Board under them who

send out the papers to Reviewers. So you have these layers of activity. But one of the jobs that the Editor-in-Chief of the *British Journal of Clinical Pharmacology* has, and the Society now has three journals, the basic journal and the clinical journal and then an online journal, is to be a Member of Council of the Society. So I was a Member of Council, reporting on the activities of the clinical journal. One day I came to the meeting of the Council, or one of the committees, and Julia Buckingham, who at that time was the President of the Society, had taken over that job in succession to Rod Flower, and Julia's President-Elect was Graeme Henderson, a Pharmacologist from Birmingham.

And Julia said to me, 'Jeff, would you be interested in being President of the Society?' Well, I was stunned, I really was. It had never occurred to me that this might be an activity I would undertake. I joined the Council or the Executive Committee in my role as editor of the journal and I said, 'Wow.' I said, 'That's fantastic, I think I would really be very keen to do that.' Because I saw it as an opportunity to promote clinical pharmacology. So she said, 'Well, I'm going to propose that you be President-Elect when Graeme Henderson becomes President' and that happened. I was proposed, there were no counter-proposals and I was elected President-Elect. The first active clinician, I think. There must have been others who had clinical qualifications, but who hadn't practised. I'm not sure about that. But certainly I was the first active clinician to be asked to be President of the Society. And the position was President-Elect for two years and then President for two years, so a four-year post.

Now for some years several of us had been concerned about the development of clinical pharmacology in the UK. The subject had really grown up during the 1960s and early 1970s, and our Department in Oxford was one of the last Departments to be formed; I think the very last one was in Cambridge, which came a few years later. But by the time the Oxford Unit was formed there were already Units of, Departments of, Clinical Pharmacology in the major universities around the country, and it was very strong. There weren't many of us, maybe 80-100 in all, but we were very active and very successful and a lot of those who became Professors of Clinical Pharmacology went on to be active in other national roles. For example, Alistair Breckenridge became Chairman of the MHRA [Medicines & Healthcare products Regulatory Agency], or was Chairman of the Committee of the Safety of Medicines, and later of the MHRA. Mike Rawlins, likewise, was Chairman of the Committee of the Safety of Medicines and he became Chairman of NICE [National Institute for Health and Care Excellence], and then chairman of the MHRA. And many others in the field had achieved important posts in national medical politics, in one way or another.

So the subject was flourishing in the 1960s and 1970s, and into the 1980s at a steady state. But in the 1990s, and I put this down largely to the advent of Research Assessment Exercises, during which universities did not rank clinical pharmacology high on their list of subjects that would score highly in those exercises. Although actually if you look around the country, Clinical Pharmacology Departments have scored highly, but for some reason I think Professors of Medicine have not regarded clinical pharmacology as a very important subject. And during the 1990s the numbers of Clinical Pharmacologists declined, and as Professors retired they were not filled, their positions were not filled, they were not reappointed. So by the time it came to the beginning of the 21st century, the number of Clinical Pharmacologists had declined markedly, and this was a matter of great concern for a lot of us, and I would find myself moaning about this when I met my colleagues at various places saying, 'What can we do about this? What can be done? Can we do something to revitalise the subject? How are we going to proceed?' And frankly, I felt impotent at that time. I had no political power whatsoever, I wasn't in any kind of position in the College or with the ear of government or anything at all. And I, as an individual, felt impotent, and I couldn't see that anybody else in the subject was having any kind of influence either.

So when I was asked if I might be interested in being President of the Society, I saw this as an opportunity to try to do something to revitalise clinical pharmacology, and I welcomed the opportunity. And other changes were occurring at that time in the Society. We had decided for example when our excellent administrator decided to retire to go to another, or to leave to go to another post, that we would instead appoint a CEO [Chief Executive Officer] to run the Society. The finances were in good shape because of the success of the journals and so the premises that we existed in had been expanded already and could be developed further. We could afford to appoint a CEO, and as a new incoming President I saw this all as an

opportunity to try to give more voice to the subject. And over the next four years I tried to take advantage of that position and of the facilities to stimulate interest in clinical pharmacology. I told the whole story of that period in a paper that I published in the *British Journal of Clinical Pharmacology* which I called '*A Great Instauration*' taking my inspiration from Charles Webster's book about the 17th century and, of course, primarily from Francis Bacon's book *Instauratio Magna*. And the developments that occurred during that time are far too many to discuss, but I was invited, last year I was invited to the Annual Meeting of the American Society of Clinical Pharmacologists in New Orleans and then last December to South Korea, and I've been asked elsewhere, to talk about the developments that occurred and how we developed clinical pharmacology. I was in Denmark just last month talking to the 40th anniversary celebrations of the Danish Society for Clinical Pharmacology about this.

What we did was to publish studies on teaching of clinical pharmacology, where we showed - and I say 'we', other people did all the work here, I can't claim any credit for any of that - but we gave it voice. The evidence was that the students valued the teaching, but thought that there wasn't enough of it. We talked to the General Medical Council about *Tomorrow's Doctors* and managed to persuade them to include in the new version of *Tomorrow's Doctors* in 2012, two pages on skills and knowledge that young doctors ought to have in therapeutics. And that was largely through the efforts of Simon Maxwell in Edinburgh, who has also instituted an assessment, a final-year assessment, now called an 'examination', which we never thought would happen, a national examination in prescribing. We talked to government organisations of one kind or another, we talked to the press through the auspices of the Science Media Centre, and we did enormous amounts of things, a large number of things to try and get clinical pharmacology into the public eye, into the government's eye, into the eyes of regulatory bodies and so on. And that work since I demitted has been continued, a lot of work by a lot of people, but it's been continued by my successors as Presidents of the Society, Humphrey Rang, for example, David Webb, Phil Routledge, and people like Munir Pirmohamed, others who have been influential in maintaining the impetus of the development of clinical pharmacology.

When I stepped down as President of the Society in I suppose that would have been about 2010, I organised a meeting in Oxford, we called it a 'James Black Meeting', because the Society organises meetings in Sir James Black's name. And we called it a 'Meeting for an agenda in Clinical Pharmacology'. I invited people from all aspects of the subject to come along and talk about pretty much every single topic within clinical pharmacology, where it stood and where they thought the future would be. And from that three-day meeting, very lively, we published a whole issue, a special issue, of the journal in which we had papers on virtually every aspect of clinical pharmacology and its future. There emerged a paradigm which I called the 'VOICE paradigm', which I published as an editorial in that issue, and which others have since been interested in learning about. It stands for 'Visibility, Outreach, Integration, Coverage, and Emissaries'. And these five different aspects of developing clinical pharmacology have been taken on by the British Pharmacological Society in many, many activities, improving the visibility of the subject, outreach to the public, to other disciplines, integration with other areas such as pharmaceutical medicine and pharmacy, coverage of areas that are neglected or have been neglected such as paediatrics, paediatric clinical pharmacology, and emissaries, which the British Pharmacological Society now calls 'ambassadors' - young clinical pharmacologists tasked with spreading the word around their departments and elsewhere about how important clinical pharmacology is.

So from that beginning as it were, from that time when we were unhappy about the way in which clinical pharmacology was diminishing in numbers of Consultants, we have started now to grow again. The numbers are beginning to come up again, and lots of efforts from a lot of people have been made to maintain and grow the discipline. There's still, I think, a long way to go, but the numbers have been turned around, that's the first thing. They haven't gone down, in fact they've started to go up. And I consider that a hugely positive effect, and I hope that it will continue.

TT: It would be about that time we started talking about doing a Witness Seminar.

JA: Indeed, that's right, and you were very helpful in arranging two Witness Seminars. I don't know if that's the only subject you've devoted two Witness Seminars to, but it turned out, with the first seminar, it was clear

that there was much more to talk about and a second Witness Seminar was very helpful, and it was part of the whole business of promoting clinical pharmacology.

TT: Going back to the Society, when did you first become a Member, and can you remember your first communication?

JA: Yes, I do remember my first communication [laughs]. I imagine everybody remembers their first communications. A bit like your first kiss. It's something you don't forget, because it is a baptism of fire, at least it was then, I think it's less so now. But it certainly was then. I don't remember when I first became a Member, it would be some time in the mid-1970s when I was doing my Thesis. In those days you had to have published at least one or two papers in the *British Journal of Clinical Pharmacology* or [*British Journal of Pharmacology*] to become a Member, and I had done that. My first paper, I think, in the *British Journal of Clinical Pharmacology* must have been in the late 1970s, 1977-1978, something like that. So that's when I would have become a member, the late 1970s. I remember my first presentation to the Society very vividly. I presented data on the work that we'd done on erythrocyte Na⁺,K⁺-ATPase activity during treatment with digoxin and of course it was very, very well-rehearsed; a 10 minute talk, eight slides only, very rigorously rehearsed in advance, timed to perfection because if you went over even one second the red lights would go on and there would be, you weren't allowed to go on any longer than that. And then there would be five minutes of questions. And of course the first person on his feet to ask a question almost always was Colin Dollery.

And Colin asked me what sounded to me like a very straightforward question, but of course those questions were never straightforward, there was always something in them that you might not realise or appreciate at the time. And I gave what I thought was a reasonably good answer and then there were one or two other questions and that was it. And then I came out and David Grahame-Smith said to me, 'Well done Jeff, that was very good.' He said, 'The answer you gave to Colin was totally wrong but you handled it very well.' [Laughter]. And so that was, I think, when I was very lucky again because I don't know if anybody realised apart from David that what I'd said was rubbish, but in those days a paper could very well be thrown out and not accepted for publication if it didn't meet rigorous standards, and so I think I was very lucky; I got away with it. But I remember it vividly.

I also remember, while we're talking about that, my first presentation to the Association of Physicians of Great Britain and Ireland, which was totally different, well similar in many ways, but different in the questioning. Again, one presented one's data, one had to be exceptionally well prepared; it was a 20 minute talk at the Association. And in those days John Ledingham was the Secretary of the Association and he had a very interesting way of preparing for publication, because what would happen was that the papers were accepted in advance, and John had come to me during a meeting in December and he said, 'Jeff, we're desperately short of good material for the Association in April. Will you send me an abstract and I'll accept it?' So I got in on a free ticket, as it were; very lucky. But anyway one prepared very, very carefully, and one gave one's 20 minute presentation, and then one was subjected to vigorous questioning from the floor and it often was very rigorous. And what would happen was John Ledingham would write the name of the questioner on the board and he knew everybody, didn't matter who it was, he knew them and he'd write their name on the board. And before the next one you had to take down all the names so that you could transcribe them and write up the paper with all the questioning for publication in the *QJM*.

Well, John McMichael was in the audience and he got up and spoke for five minutes about his experience with digoxin and I didn't have to answer a single question. It was wonderful. Again I got off the hook completely because of that, and I didn't even have to take down any names; it was only Sir John McMichael, as I recall. I need to go back and look at that original abstract, but that's my recollection of it. So what should have been a real immolation turned out to be a very pleasant experience. I was very lucky.

TT: You were talking about Clinical Pharmacologists and the Society. Is that the natural home for Clinical Pharmacologists? What about the Royal College of Physicians and its Faculty of Pharmaceutical Medicine?

JA: Yes. The natural home, I believe, for Clinical Pharmacologists is the British Pharmacological Society, without doubt, for all Clinical Pharmacologists who are clinically-qualified. There is some debate about this - I should say in passing, I wrote a paper a few years ago in which I defined a Clinical Pharmacologist as someone with a clinical qualification. There are people who call themselves 'Clinical Pharmacologists' who do not have a clinical qualification. And these are people who have contributed enormously to the subject without doubt. But in my view calling them 'Clinical Pharmacologists' gives other people the wrong impression of what clinical pharmacology is. And although I have huge respect for those people who have contributed a huge amount to clinical pharmacology, if they're not clinically qualified then I feel people looking into the subject from outside get the wrong view of what clinical pharmacology is. And I think it's important for the development of the subject that Clinical Pharmacologists called 'Clinical Pharmacologists' should have clinical qualifications. I've said this and I raised a whole furore about that because others said, 'Well, what about all these people who aren't clinically qualified?' And I said, 'Well, they should call themselves something else: Systems Pharmacologists or whatever.' Some other title. But we are in a precarious position still, I think, and we need to be seen to be clinicians who are active in clinical practice. And I think that's important.

So, given that caveat, I do think that the British Pharmacological Society is the right place. There has always been place for a clinical section in the Society and now we have alternate Presidents, clinically and non-clinically qualified, so I think it's the right place for Clinical Pharmacologists. Now there are other societies, you mentioned the Royal College of Physicians. Well, if you're a clinician, you're almost certainly a Member, or more likely now if a Consultant, a Fellow of the Royal College of Physicians, as I am, and that is part of one's home, there's no doubt about it. But the Royal College of Physicians is a much bigger organisation, it doesn't specialise in clinical pharmacology or pharmacology, it deals with medicine as a whole. And so I don't see clinical pharmacology sitting as comfortably there as it does in the British Pharmacological Society. It is nonetheless an important part of one's living space, and we are all part of that College, and we do take part in its activities. The College has a liaison committee between the College and the Pharmacological Society, and so we have the opportunity of communicating with the College, between the College and the Pharmacological Society, and that is a very useful institution. And for example, the current President, Jane Dacre, comes to those meetings, and is very active in advising clinical pharmacology, and is very helpful. So I think that's a useful interface between Pharmacological Society and the College.

TT: When did that liaison start?

JA: I don't know when it started. It's been there for several years and I think different College Presidents have taken different degrees of interest, as is bound to happen. The current President is very active with the Pharmacological Committee and contributes enormously, and her presence is very much appreciated. Then the College, as you say, has the Faculty of Pharmaceutical Medicine, and I have an Honorary Fellowship in that Faculty; they were very kind a few years ago to offer me Honorary Fellowship. That is primarily for physicians working in drug companies. They have their own examinations and their own diplomas and so on, and they are very active in pharmaceutical medicine within drug companies. So it's a place for Clinical Pharmacologists to be if they are working in drug companies and in fact I rather regret that in recent years Clinical Pharmacologists in drug companies have had less contact with the British Pharmacological Society. That may partly be because of the Faculty of Pharmaceutical Medicine, but I think more so it's because over the years, drug companies have appointed people who are not clinically-qualified into positions as Clinical Pharmacologists. So clinical pharmacology in drug companies is now largely run by people who are not clinically-qualified, although there are clinicians there of course, but a lot of Clinical Pharmacologists are not clinically-qualified.

And so I think they're less interested in the clinical pharmacological activities of the British Pharmacological Society. And I suspect - and I may be wrong about this - that the drug companies are not so keen to allow their employees to spend time going to the British Pharmacological Society, away from their work in the company. I still do see people at the Society who come from industry, or from the drug companies, but many fewer than used to be.

TT: Thank you so much Jeff.

[END OF TRANSCRIPT]

Further related resources:

1. Aronson J (1996) Curious, yellow. *British Medical Journal* **312**: 28.
2. Aronson J K (1985) *An Account of the Foxglove and its Medical Uses 1785-1985*. Oxford: Oxford University Press.
3. Aronson J K (2010) Clinical pharmacology and therapeutics in the UK - a great instauration. *British Journal of Clinical Pharmacology* **69**: 111-117.
4. Aronson J K (ed) (2016) *Meyler's Side Effects of Drugs: The International Encyclopedia of Adverse Drug Reactions and Interactions*. 16th Edition. Amsterdam: Elsevier.
5. Jones E M, Tansey E M (eds) (2015) *The Development of Narrative Practices in Medicine c.1960-c.2000*. Wellcome Witnesses to Contemporary Medicine, vol. 52. London: Queen Mary, University of London.
6. Overy C, Tansey E M (eds) (2013) *Drugs Affecting 5-HT Systems*. Wellcome Witnesses to Contemporary Medicine, vol. 47. London: Queen Mary, University of London.
7. Overy C, Tansey E M (eds) (2014) *Migraine: Diagnosis, treatment and understanding c.1960-2010*. Wellcome Witnesses to Contemporary Medicine, vol. 49. London: Queen Mary, University of London.
8. Reynolds L A, Tansey E M (eds) (2008) *Clinical Pharmacology in the UK c.1950-2000: Influences and Institutions*. Wellcome Witnesses to Twentieth Century Medicine, vol. 33. London: Wellcome Trust Centre for the History of Medicine at UCL.
9. Reynolds L A, Tansey E M (eds) (2008) *Clinical Pharmacology in the UK c.1950-2000: Industry and regulation*. Wellcome Witnesses to Twentieth Century Medicine, vol. 34. London: Wellcome Trust Centre for the History of Medicine at UCL.
10. Tansey E M (intvr); Tansey E M, Zarros A (eds) (2016) *Aronson, Jeffrey: transcript of a video interview (25-Apr-2016)*. History of Modern Biomedicine Interviews (Digital Collection), item e2016055. London: Queen Mary University of London.