

Professor Cecil Gray CBE KCSG FRCP FRCS FRCA
in interview with Dr Max Blythe
Oxford, 25th November 1996, Interview Two

MB Professor Cecil Gray, when we last talked in this studio we got to the point at which you were coming home, quite ill, from North Africa, at the end of your army career, to Liverpool, okay. You soon recovered I think and then got deeply involved in anaesthetics.

CG I was pretty recovered on the way home. I didn't quite know why I was sent home, actually. I think they just didn't want to take any more risks, I should imagine.

MB But you were quite ill at one time.

CG Oh yes, oh yes. I had bronchial pneumonia.

MB You were in some respiratory distress and they sent you home?

CG Very much so. Not when I came home. I was fine then.

MB On the journey things looked up.

CG Things were marvellous. It was a Canadian hospital ship, and the sensation of sailing through the Med and across the Atlantic with full lights on... you know, when we had gone out and, in fact, had watched a ship being torpedoed on the way out, to sail back with full lights on in good company was an excellent convalescence.

MB Cecil, what I want to do right away is to go to this reunion with the anaesthetics world of Liverpool, because you settled into that very quickly.

CG Yes. I had to go and be discharged.

MB Right.

CG And I went to Chester to be discharged. I then took up all my old jobs in the hospital.

MB Right, principally working with Charles. Charles Wells.

CG Working with Charles, very much so. I still did the Northern and Charles was then, I think, at the Southern Hospital and I had a paid job, thank God, at Smithdown Road, one of the local authority hospitals. There was a thing called EMS, the Emergency Medical Service, and they were looking for anaesthetists and I got a few sessions there. So, you know, we started off quite comfortably really.

MB And still quite a lot of private practice with Charles.

CG Oh, a very large amount, and with [T P] McMurray, professor of orthopaedics, the one with the P, P, P, you remember, I told you about, all the way down.¹ Then I had a very eccentric senior surgeon called Rawlinson. Rawlinson was a man who... he never committed a fault, but everybody else did, and when things were going wrong in an operation he would put down all his instruments and would say, 'My God, why am I always surrounded by imbeciles?' But he was a remarkable man. Now, he has a place in history because he was the first surgeon who had a patient given curare in Liverpool, because I was working with him for a gall bladder [operation], and I got his permission to drip the old curare stuff in, but that is much later.

MB Let's come, though, to how you got into the curare story, because that is a fascinating story. Can we take that in at this point?

CG Yes certainly. The outstanding anaesthetist in Liverpool at that time was a man called John Halton. I have got his picture here; I thought you might be interested in that. A very strong man and he had been called up into the Air Force, but because he was the only man in the North West who could do thoracic anaesthesia and was capable of doing that, he got two days off from the balloon barrage, which he was put on at New Brighton, two days off – he was medical officer to the balloon barrage – two days off to work with a fellow called [Hugh] Morrision Davies, a very distinguished thoracic surgeon in London. He did the first pneumonectomy in this country at UCH [University College Hospital] in London, and then he injured his finger, it got poisoned, he pricked his hand and he got septicaemia and lost a finger. So it was like that and he gave up surgery and he came north and opened a sanatorium in North Wales in Llanbedr, a TB sanatorium. And then he started a thoracic unit, a thoracic surgical unit, when as it were he plucked up courage to get back to surgery, in Clatterbridge Hospital on the Wirral. And he got John Halton as an anaesthetist. John was an extraordinary man. He invented... they used to have block off...we used to have trouble with one bronchus, one part of the lung affected with pus in it, and the great thing was to try and block this off. And most people had to get a thingamajig and push a wire and a tube on the end of it down, which was very skilful and so forth. But John went to the trouble of measuring the distance between the nose and the teeth, and the teeth and the various openings into different parts of the lung. And then he invented a piece of spinal tubing wire with a little hole through it, a balloon on the end, and a little piece of rubber here at the mouth, serrated so it clicked as it went down. And he got the measurements down, and he could direct this wire into any part of the lung, blind. He gave this thing at the Royal Society of Medicine, actually. He was a very well recognised fellow. He was a bit of a maverick in many ways, you know. He was an extraordinary man, and became a very great friend of mine. So we linked up a little bit. At that time there were journals in England that were not producing work from America, because of the war. Very indifferent, as they came out, certainly the anaesthetic journals. The BJA, *The British Journal of Anaesthesia* was a mess. And one day – we used to have a beer occasionally in the evening, John and I – and he said... by the way, he had joined the mess at the Bomber Squadron, the American Bomber Squadron, just outside Warrington.

¹ Professor Gray is referring to a list of private patients.

MB At Burtonwood.

CG Burtonwood's correct, yes. He'd joined the mess there and of course was very popular and a tremendous chap – a bit like yourself Max, actually – but extremely popular. He got in with some of the chaps there and they told him about curare and what was going on in Montreal, since 1942,² and this would be about early '45, the end of '44. So he said, 'Do you think you can get me some of this stuff?' you see. The stuff was in fact a total extract of the vine, the *Chondodendron tomentosum* vine, but the active principle which made that vine a part of the curare mixture for the Indians to shoot their arrows. And Squibb produced a total extract and then standardised it with a thing called a rabbit head drop. They found the dose which made the rabbit drop its head like that, and that was one unit.

MB Right.

CG But very crude if you can see what I mean. John got some of this stuff and brought it back.

MB They brought it in for him?

CG And he was only doing two half days or two whole days of thoracic work at Clatterbridge, and that is all. And I was doing this massive practice, working day and night, and weekends and he said, 'Look here, you'd better take most of this, I will keep some of this for my thoracic work, you have the rest.' So I did, and I said to him, 'What are we going to do with this? We'll try it out.' We both tried it out and then we had our pint of beer the next week and we said, 'Well, it is pretty interesting, it certainly produced a relaxation, but doesn't quite do what...' By this time we were getting short of supplies and in fact we ran out of supplies, and I said to John, 'I'll tell you what we'll do. Do you remember that stuff that we used to use as medical students, to paralyse frogs' muscles, that was called Curarin, if I remember rightly.' He said 'Yes'. I said 'Well I'll get in touch with Rod Gregory,³ and see if he has got any of this stuff available,' you see. So, I went down to the University [of Liverpool] and got hold of Rod Gregory, who was then the senior lecturer in physiology. He was a very tremendous scientist. He in fact isolated gastrin for the first time, but was widely internationally recognised, and a great investigator and a very nice man, and very clinically oriented, very interested.

MB And you said went on to high office at the Royal Society in due course.

CG Oh yes he became vice-president of The Royal Society and had a Feltrinelli, an Italian award for outstanding distinction for physiology. I went down and of course was welcomed as always. Rod welcomed everybody, anybody who'd got any proposals, particularly this sort of thing. He said, 'Oh yes you can have some, we've got some, we're not using it now, you see.' He had a cupboard full of this stuff, you know, boxes of phials, little thin phials with a white powder in it and it had written on

² Professor Cecil Gray is referring to the work of Canadian anaesthetist, Harold Griffith, who, on 23 January 1942, used curare for the first time to produce muscle relaxation in anaesthesia.

³ Roderic Alfred Gregory was senior lecturer in experimental physiology (1946-48) and George Holt professor of physiology (1948-80) at the University of Liverpool.

it, Curarin. So I looked at it and said, 'This is very interesting.' It was Burroughs Wellcome. So I said 'Will you...' He said 'Take the lot.' So I took the lot, you see, and got hold of John, and he came up to the Northern Hospital. So I said, 'What are we going to do with this? We had better sterilise it in some sort of way.' So, we put it into an autoclave. I don't know if you know what an autoclave is for, steam pressure, heat sterilising. But in the ampoule, of course, I don't know what it did of course, I don't know if it did anything. Then we got a bottle of saline... I did this and tipped 100 milligrams in, so we knew how much per cc. It was a pint of saline, which is 500 ml, so we know how much per cc, you see. We tipped it in and stuck the thing in and put the drip needle in you see, and splint and needle strapped to the vein, and it was a cholecystectomy for old Freddie Rawlinson, Freddie 'Popples' as we called him, you see. He had given permission. I said 'Do you mind if I try this?' 'No, not at all.' So I gave the old Pentothal [thiopentone] and a bit of cyclopropane, and started this stuff as he opened the abdomen, you see. And it was so dramatic. I shall never forget that minute when I saw the relaxation that I produced. We had to produce relaxation for an operation, and the belly just went brrr, like this you see, and he felt this and he said 'God, what have you done?' So I said 'That's marvellous.' But the respiration... we didn't give much and the respiration wasn't entirely abolished, and it makes me sick when I think of it now, but I had a long tube with a bit of cotton-wool at the end, which indicated the patient's respiration because it was connected to the endotracheal tube. Anyway, there it was. And afterwards, he was a very slow operator, and I don't think then at that time we had... at first what we called, originally it was supposed to be physostigmine, we had prostigmine available, knowing that it would be the antidote to this stuff. But I certainly didn't use it in those early cases, but watched them and afterwards, and gave so little that they recovered reasonably quickly. This was an unbelievable experience, and of course John then went off with this load of Curarin and we gradually built up our technique.

MB He was dealing with Morrision Davies's kind of thoracic end and you were doing the abdominal surgery primarily.

CG I was doing everything else, orthopaedics, everything.

MB Right.

CG But gradually learnt to use it more and more for everything, particularly for endotracheal intubation with Pentothal. And very gradually we worked out the sort of dosage which would be necessary. We found 15 milligrams at that time, but over the next few months of course we built it up to 45 milligrams, controlled respiration, and we got into the whole business of what became our technique eventually. But it was a slow, gradual process.

MB So where you were going was actually producing phenomenal muscle relaxation, that impressed you deeply.

CG It certainly did.

MB And deciding to take over the ventilation side because that was the price to be paid for such relaxation.

CG It had to be, you see. We got away for quite a time, I suppose a month or two, really, with just smallish doses. I couldn't see why we shouldn't go ahead and give more and we gradually got so that we got used to always squeezing the bag. We became what were known as bag squeezers, you see.

MB That came very quickly?

CG Yes, it came very quickly. My knowledge was helped of course by John, who had to abolish respiration and he used it and was having great success with this and applied it to the abdominal operation, and the result of course was fantastic. I mean whereas patients in the old days, particularly with ether or anything like that, they would lie doggo for an hour or two afterwards and have chest trouble, spitting and coughing, and pneumonia was not unknown in these days. And here we could have light anaesthesia, so they would be reading the *Liverpool Echo* in the evening. This was very dramatic, and that's really how the beginning started. We worked it up to elaborate the technique and... Jack and I used to meet very frequently; I should think at least once a week and talk about what was going on. And we came to the conclusion... I don't know if we came simultaneously to the conclusion, but we gradually use more and more prostigmine as we produced more and more relaxation with curare – always with atropine. Now, the Americans were frightened of prostigmine because of its effect on the heart: give enough of it and it will just stop the heart, you see. But if you give atropine, atropine blocked that action but didn't block the action on the muscles, the reversal of the tubocurarine. And we worked out the technique in which we were giving atropine and prostigmine, feeling our way until we got the right sort of dose. Then over the months, I suppose it was – yes it was certainly months – we came to give it absolutely routinely, because there was no trouble.

MB This is essentially, Cecil, in your first year of actually encountering curare.

CG Oh certainly, because my paper, which we did, between Jack and I, we did a thousand cases, and I started a thesis collecting all my cases. And we did the paper by... I think the paper was given in...

MB March '46, I think.

CG 1946, that's right.⁴ That was fortunate because in North Africa I met a fellow, a lovely chap, who was an anaesthetist, whose name just escapes me for the moment, from the south. And he was the president of the Royal Society of Medicine at that time, and he had asked me before if I would give a paper, because I had worked with him in North Africa. Would I give to his first session? So I said 'Sure.' And of course I had the subject there. We worked like hell between us to get a thousand cases and drew it together to present a paper. A good deal of my contribution was on the history of curare, the arrow poison and its origin from the *Chondodendron tomentosum* and the effect the Americans were having and so forth. Then I presented the abdominal cases and John came in and presented his thoracic cases and it was a

⁴ The paper was presented by Gray and Halton to the Anaesthetic Section of the Royal Society of Medicine on 1 March 1946 and subsequently published in *Proceedings of the Royal Society of Medicine*, see: Gray, T.C. and Halton, J.A. 1945-46. A milestone in anaesthesia (d-tubocurarine chloride). *Proceedings of the Royal Society of Medicine*, **39** 400-410.

very packed meeting. Of course, the thing which we hardly recognised was that Curarin was... in fact, we didn't recognise it at the time, d-tubocurarine chloride, a pure alkaloid from the crude curare isolated for the first time in 1935 in the Wellcome Institute by a fellow called Harold King. And it had lain in the Wellcome there. If only we had known about it, we would have been ahead of the Americans, if we had thought and used our nous, we would have been ahead of the Americans in first introducing curare. But we were certainly the first to introduce a pure alkaloid, a controllable drug, you see.

MB The Americans didn't really like it, I mean that is the point. They let it fall out of their grasp didn't they? I mean, you really took it on.

CG Yes. I think so. There is no doubt about the answer there.

MB I mean let me put just one more point.

CG They took it on with tremendous... There were one or two them who had got my idea, which I think, I am not sure... I read all the literature by this time from America and so forth. And it became very clear to me that the whole thing about this was light anaesthesia. I thought that from the beginning.

MB And that was your contribution?

CG Absolutely. You must have less... There's no good giving...

MB That was the point I was making.

CG But they were for moderately deep... and just helping out when you got into problems.

MB This was an ancillary thing in their hands.

CG Yes, except one or two of them. And [R M] Waters, a man called Waters, who was the godfather of anaesthesia in America, the first scientific anaesthetist, from Wisconsin. And he did a... quite incredible, to read his paper. He did a hundred cases of his crude curare, Intocostrin,⁵ with nitrous oxide and oxygen alone, because he was an artist with nitrous oxide which is very light anaesthesia. And he did this, but it didn't seem to go on somehow. What happened to him after that I am not at all sure. And there are two other chaps too, whose names again escape me, who were advertising doing it. . And one chap, a fellow called Whittaker, actually did, I think it was ten caesarean sections with curare only and no anaesthesia. Now, work that out if you don't mind, you know. I have never been able to work it out. I've never been able to work it out. They must have been anoxic or something, hypoxic. I just don't know. But there it was. He wrote this paper with only curare, which was all encouraging to us because we could give larger doses... They were giving (?) doses. Then the blow came in America with this fellow Beecher, Harold Beecher⁶ in Boston, who was a real Bostonian chap, you know. His juniors never saw him in the

⁵ Intocostrin was a product of E.R. Squibb.

⁶ Professor Gray is referring to Henry K Beecher, the first professor of anaesthesia at the Harvard Medical School in Boston.

anaesthetic room, he was doing private work upstairs, a professor. But he wrote... he did a very ambitious project. He surveyed five years of anaesthesia from ten teaching units, hospitals, university hospitals in America and collected a huge number of cases. And they were all ante-respective, not retrospective, all ante-respective, you know, the view as it went on; you didn't look back and go back to your records, it was as it happened. And he collected these cases and it showed an enormous mortality from when they used curare. I've forgotten what it was, but it was quite unbelievable, the figure was. I thought that this was impossible, and when he published the paper it was quite obvious these patients were returned to bed still curarised, and lying there. (*Cecil Gray imitates a patient gasping.*) Now, the secret was when they were still curarised, breathing ineffectively, not only was that not good for them, from the point of view of the collapse of the lung and so forth, but also they accumulated carbon dioxide. Their carbon dioxide tension went up, which potentiated any residual curare, so it became a thing called residual curarisation, which was a thing unknown to us. We invited him over to Liverpool to argue with him.

MB Really, that was in the later '40s, after your paper to the Royal Society of Medicine, sometime after that?

CG A bit later than that, the later '40s. But I persuaded him, and I went over to see him, and persuaded him to come back and we had real ding-dong, sort of discussion. So that is how it was.

MB Just looking at that publication that came out in 1946, The Royal Society of Medicine publication, a seminal work of that time...

CG Called 'A Milestone in Anaesthesia, d-tubocurarine chloride, question mark.'

MB That's right. Was that roughly the same time, the same year, towards the end of '46, that your thesis came out?

CG Well, my thesis was a bit later. I wrote up the thesis I think after that.

MB I got an impression that you were working on it at the same time

CG I was doing a lot of research as well. I was trying to justify giving very large doses, and we didn't know quite what [effect] large doses had on the circulation. And again I got in touch with Gregory and told him my problem, and he said, 'Oh come down Sunday morning and we'll make a Starling heart-lung preparation in the dog.' He taught me how to do this, and this was a preparation which isolated the heart and the lungs; you could measure the blood pressure, the arterial pressure, and the venous pressure, and of course if the heart was failing, the venous pressure went up. And recording it... in those days we had no electronic recording, they were kymographs, you know, smoke drum stuff, and a little thing going like this. (*Professor Gray imitates the movement of the recording stylus of a kymograph.*) And I used to go down every Sunday morning. I did a whole series of these heart-lung preparations. We found... I learnt a lot about my future anaesthesia from that because I was giving anaesthetics as well to the dog, and we found that the curare alone... the dog was anaesthetised with Nembutal, so that it was intravenous Nembutal, it didn't do much to it, just put it to sleep, well to sleep. We found that the only effect on the heart

myocardium was to increase the efficiency of the muscle – very slight. But the venous pressure always came down when you gave a good dose of curare. So I mean that was very, very encouraging indeed. But another thing I found – and I did a huge number of these things – was that with any anaesthetics, the heart began to fail, you see, because it had no compensatory mechanisms to put it right as we have, but if you showed an ampoule almost of thiopentone, it went brr, like this, dead. The slightest thiopentone in this preparation was absolutely awful, fatal. This taught me a hell of a lot really about the action of these drugs. So that was a step because then we knew curare was safe. Reverse it at the end, large dose, fine, provided you got it to a stage in which it was reversible. So that was really the beginning of the Liverpool technique, but there was one further step, taken after... that was a bit further, in fact, than we got when we did the thousand cases.

MB Right.

CG Although we had done the heart-lung preparations then. Oh, the other thing I did which was pretty awful, and when I think back, I mean fancy putting this stuff into a patient. Now you wouldn't be allowed to do that. We found out afterwards that tubocurarine releases histamine and can cause bronchial constriction. Well, we knew nothing about that at that time. Although we did know, it released... Gregory was the authority and when he was in UCH [University College Hospital], he did some experiments showing drugs could release histamine, including some of the... not curare, he didn't use curare, but one suspected it might do. The next adventure after that was we went on to find... and Jack Rees [Gordon Jackson Rees] came into this very much indeed, because he was using (?) and using the bag squeezing all the time.

MB We have got to get him into the story in a moment.

CG Shall I stop there?

MB No, we will probably come to putting Jack into the story in a moment or two. I have got a couple of questions I really would like to ask you at this stage.

CG I'm talking too much.

MB No, no. You have got me deeply into the research of that time. What I was wondering, was just how much research was going on in anaesthetics nationally and internationally? It felt as though you were to some extent rather out on a limb, working on a lone cause. It didn't feel that there were many collaborators or people involved in anaesthetics research. I am right in that impression?

CG No. There was research going on. Pask, [E A] Pask, in Newcastle, was the reader there, was a brilliant, brilliant man, but his research was slightly different, clinical, and getting a correct assessment of situations, and such things as the efficiency of the Water's canister, and these things. This was good clinical research. I don't really remember anybody was doing any animal research at that time at all.

MB So you were pushing a little bit further into a research arena...

CG This was knowing Rod of course, Rod Gregory.

MB And you had all also had this golden view down the possibilities of anaesthetics with curare, which would change the whole thing.

CG That's right.

MB You'd had that by then.

CG That was it, oh yes. Firmly sort of between the teeth and so had Jack [Gordon Jackson Rees], to be quite fair.

MB Well, we are still going to bring him into the story – I won't be long. But I am just wondering about the sense of ambition that must have been strong at that time.

CG Oh, it was exciting. Oh exciting as hell. But, of course, it also increased my practice further because the surgeons loved it and the patients did well. Now, my colleagues were a bit, with exceptions, a bit, very cautious about this. In fact one of the most... a contemporary anaesthetist trained with Minnitt, came back – he wasn't in the army, because he was a Quaker, so he went as a ship's surgeon or something.

MB Who was this?

CG A fellow called Hargreaves, John Hargreaves. He was never what I would call a curare man. It was always ether, top it up with a bit of curare. And strangely enough, I went to a funeral with him the other day and we were talking about this. But he was never one of us, in that sense, that we were going ahead on this line. Of course, John Halton was marvellous, absolutely, a great, great fellow.

MB We haven't put [R B] Harbord in the picture, by the way. There are a number of anaesthetist satellites around...

CG Well, Jock started... he was ahead of me with Minnitt, started training, and he was a year ahead of me in medical school. He was a dour sort of chap, very nice, very nice, very dour. And he started with Minnitt and, in fact, he became the secretary of the – there were no full time anaesthetists, you see, really, at that time – he became secretary of the Liverpool Society of Anaesthesia. And it was he and Minnitt – I was then a bit on the picture on the committee – who went and presented the case in 1947 for a department of anaesthesia. Jock became the reader of anaesthesia in Leeds, and I was delighted to see him go, because I knew the job was coming up in Liverpool, and I knew that Minnitt liked him very much. Minnitt was a sort of lecturer in anaesthesia at that time. So I was very pleased when Jock went to Leeds because the way was then open when the Liverpool job was then advertised. He was a nice guy but he was a dour fellow, not very imaginative.

MB Talking about people not very imaginative. I am going to go back to that 1946 meeting of the Royal Society of Medicine, because I don't think that was a very imaginative gathering. You presented a paper that we have seen as exciting, but I don't believe it captured the imagination of that audience.

CG You mean the 'milestone' paper?

MB The curare paper, yes.

CG Oh, absolutely did.

MB Did it?

CG Oh yes.

MB That really got people on the...

CG Oh absolutely, yes. I have no doubt about that. I mean that is where I started, and it was because of that paper, no doubt at all, that my career really launched. There were those who criticised. One fellow I think had written up twenty cases, within a month or two before, using the American preparation. He got up and criticised, this was quite appalling using these doses and so forth, and couldn't agree with it. Others...well, you know on the whole it was very well received.

MB Right. Nice to have that on the record.

CG Very well received. In fact it was... the place was packed and they knew it was going to be pretty good, you know, exciting, and it was a very exciting night.

MB Now, we have come to the golden moment. The university career that was about to burst. You were appointed to a readership.

CG Yes. Minnitt told me that I had better get my MD in quick if I was going to apply for this, because they couldn't appoint anybody who didn't have an MD. I'm not sure now if Harbord had an MD or not, I think he must have done, I don't remember. But so I did. I got it in and [Robert] Macintosh from Oxford here was the external assessor, and I met Minnitt after the interviews and he said 'I think it is all right.' And got it and I got this MD, which would be in June of 1947. And then, you know, everything went ahead then.

MB You opened the department that autumn.

CG In the October, yes.

MB But not much to be seen on the ground, kind of office secretary, but that was about it.

CG Oh it was terrible. This was the time when... what was the name of the chap who, the committee who introduced full-time clinical departments for the first time... '46, 1946 that was, and this was one of the early ones in anaesthesia. It wasn't the first, it was one of the early ones. And it was difficult because I had a wife and two children and I was making a lot of money and working far too hard, quite ridiculous, weekends and going down to Wales to give anaesthetics for Charles [Wells] and down to mid-Wales to give anaesthetics for gynaecologists on the weekends. I thought well, this is not going to go on, and I am very interested in teaching. I already

had a little class at the Northern Hospital, which I had done earlier on. People like [John E] Riding, and I don't think Stewart(?) was there, no he wasn't in Liverpool then, he came later, but Riding used to come with his wife Joyce, and they were two of those very early classes, I think.

MB That was a teaching opportunity that you created. You brought that to bear.

CG. Oh yes, in the Northern Hospital you know, to teach anaesthesia. It was obviously necessary, if we were going to have a speciality, we had to have somebody who was learning to do it properly, and learning the theories. So when it came, the advertisement appeared, I applied for it, and there was one other applicant from Manchester, and I got the job. Then I was faced, I was going to be a full-time, from the October, a full-time employee on a salary of fifteen hundred a year, and I had been earning, I think, that was one third of what I had been earning—a lot of money in those days. And my wife was utterly co-operative, and delighted really. And that one went ahead and now they... From teaching, the one thing I wanted to do was to start a proper course in anaesthesia.

MB Right.

CG And. Oh you don't want to mention Jack.

MB Yes, we have got you into the department now and this flows just beautifully, because you weren't long in that department in '47, when you invited Jackson Rees to join you.

CG What would I have done without old Jack?

MB You had better talk about the meeting though, because I think that is an important meeting you had. Some cocktail party?

CG Oh no.

MB But you asked him, you asked him to join you?

CG I was at a surgeon's cocktail party, but that was later. No, I was working with Charles. I was going to be the reader you see, but I had no staff. I had been told that I had fifteen hundred a year, and that was it, you see, working at the Southern Hospital with Charles. Jack was on a demobilisation grant, a sort of registrar, and he used to come with me, and used to ask some very embarrassing questions.

MB So you didn't like him around sometimes.

CG Well, I liked him around, yes. Oh no, not that sort of thing, but he struck me as being a bit precocious, you know, and I felt, well damn me, this chap knows a hell of a lot more than I do about physiology. I knew practically no physiology in those days, you know, and most of my work had been very empirical, and guided in the scientific side by Gregory. And I felt well, this chap is going to settle down in Liverpool, I think it would be very nice if he was with me rather than against me, you see. Because I realised you had to carry your chaps with you, the other anaesthetists

somehow, a lot of them part-time general practitioners... But if you are going to have a department that is going to be successful, you had to have them with you, and Jack was so outstanding. I had one job which I had inherited from Minnitt. Minnitt resigned and I was appointed, not because I was appointed, but because he wanted to resign, he was fed up, to go back to his general practice. And I had one job which was a hundred pounds a year, for a part-time demonstrator, so I here I saw a very bright fellow, quite obviously outstanding, and I asked him if he would be good enough and would like to take this on. He took it on, and really that is how it started. Now, I set up the department and I was given one lab and one room in the department of surgery. Now, this is the good thing about Charles Wells which ought to be on the record. There was a pride thing among my colleagues who had taken academic jobs that they were not going to be a sub-department of surgery. They were going to be independent, because we had always been rather dominated by the surgeons, you know.

MB You were the second team.

CG Yes, but we were essential to them, but to be told to do what, you know, more or less, but we weren't always co-operative, but that was the sort of ethos. And I was determined and so was [W W] Mushin, the three of us, and Jock Harbord too, that we would not be sub-departments of surgery, and [E A] Pask at Newcastle.⁷ And I said this on my appointment, I said, you know, 'Am I going to have my own departmental ground, independent?' 'Oh yes, certainly. No doubt about that.' In those days the department went to the departmental grants committee, and put its wants before the departmental grants committee. My first job was to get well in with the vice-chancellor. I got to know him very well indeed, and he was tremendously helpful to me. Before I put anything up, I used to 'What do you think about this Sir?' He says 'Oh put it up, put it up.' And almost, in fact, almost till I retired I regarded my department as having been independent, and in fact it only became independent in theory when I became the professor in 1959. But Charles Wells never once in any way interfered and was determined that I should be independent of him. And in fact starting off with one lab and my own little room near the roof, he gave me another lab, when I was getting so busy without any hesitation, 'Take that one.' Because he didn't do much experimental work to be quite honest, and he was delighted to have somebody associated with the department of anaesthesia work. He was delighted to have this going on. I think a remarkable tribute to him, and I shall be eternally grateful. He was a tremendous help.

MB Charles Wells was still the great surgeon in Liverpool in those post war years?

CG Oh yes. Until he retired, oh until he retired without doubt. He was invited to Pakistan to set up the medical service, and he went out there with a team of a theatre sister, and I think somebody else. He set... not only did he teach a lot of surgery, but he set up the medical service, and got the Star of Pakistan, of which he was inordinately proud. He was always a tremendous help to me.

⁷ W W Mushin was appointed director of anaesthetics at the Welsh National School of Medicine at Cardiff in 1947 and became professor in 1953; R B Harbord was the reader in anaesthetics at Leeds University; E A Pask was appointed reader in anaesthetics at the University of Durham Medical School at Newcastle upon Tyne in 1948 and became professor in 1949.

MB Just bringing you back to that department you were in the process of setting up. Knowing you, you were very enthusiastic about the teaching. You were very enthusiastic about getting the right staff, even though it was going to be a rather small team. And you were also deeply committed to research, because I think of the curare experience. Am I right at the start of that department, you had three essential thoughts in your mind?

CG- I think so, yes, yes. I hadn't a technician to start with. They gave me five hundred pounds to equip my lab. It's comic now, isn't it but I suppose if you multiply it by a denominator now... But it wasn't very much, and I wanted a technician, so I went off to Mountford,⁸ and said 'Will this be all right? You know, can you...' and he said, 'Oh, go and ask the committee, it'll be all right.'

MB So you got what you wanted.

CG I got the money for a technician and a secretary. I got money for a technician but I had to find one. That wasn't easy, because sort of medically scientific technicians are not easy to come by, and demand a lot of money. I had a brother who was the owner of a chemical factory in Poplar, and my elder brother, he is thirteen years older than I, graduate of Liverpool too. We were good friends always and I went down to see him and I said, 'Have you every come across anybody who would be suitable?' Oh he said 'I have got the very man for you.' And I said 'Oh, who is that?' He said 'He is a Pole.' You know a lot of Poles came over, and this fellow came over. He said 'He has been trained as an electrical telegraphist,' or whatever it is, you know. 'Extremely good on gadgetry.' 'Oh,' I said 'I would like to meet him.' A Mr Zielkowski(?). I immediately liked him, a very nice man, young man. He said he would love to come. So he came, he got an increase in salary and came as my technician and stayed with me until he died really and was a marvellous help, fitted in beautifully, soon learnt all the gadgets, setting up the thing for the heart-lungs and whatever else we were doing, and the kymographs and so forth. And of course graduated slowly onto blood, gas analysis with the old Haldane, and the other one that used to shake, I've forgotten what it was called now. Did a lot of work on blood gases, and blood nitrous oxide, how much nitrous oxide was necessary for anaesthesia and so forth. But I was going to tell you earlier on, the big experiment I did before the paper, no after the paper, just. I got three chaps, one was a physiologist, the other was a registrar surgeon and there was a third chap, whose name I have forgotten who it was now, who allowed me to give them forty five milligrams of tubocurarine conscious - terrible when I think of it now. And of course they had to be breathed for, you know, the tube passed, and breathed for them. To begin with they were put in - oh no, I was planning to put them in a (?) cupboard but indeed came round to squeezing the bag for them. And these were on Sundays mornings out in the Fazakerley because I wanted to know about consciousness with curare, because this fellow Whittaker had done a hundred cases and I didn't believe him. I wanted to find this out and they agreed. Physiologists, if you don't mind. The only compensation was that they would come and have lunch with me afterwards at home, but they were terribly good about it. And these experiments (?), but they were terrified, absolutely terrified; blood pressure went up, and it was very unpleasant. I shouldn't have done

⁸ Sir James Mountford was vice-chancellor of the University of Liverpool from 1945 to 1963.

it, but it was worth doing at that time because I knew that forty-five milligrams didn't produce any effect on consciousness, and there it was.

MB What an incredible thing to do.

CG Yes, it was, wasn't it, and very naughty really.

MB An incredible bit of pioneering though.

CG Mind you we were pretty, well absolutely sure that they wouldn't pop off. We had absolute control of the situation. They knew and they came back twice. One of them didn't, two of them came back twice. It was all very exciting.

MB Cecil, I know that Jackson Rees, Jackson became very quickly involved in collaborative research with you. And also on Sunday mornings you were involved in trying various regimes of curare and other anaesthetics together.

CG So he tells me.

MB That's what he said. That must be right I guess, his memory is rather good.

CG It must be, I have forgotten it actually. That was also associated with consciousness, so it must have been about that time, I think. But Jack was an incredibly good adviser, I mean he had all the physical knowledge, was very good on physical knowledge, tension in membranes, and he is a better physiologist, a better student altogether.

MB So you began to feel a team worker. A complementary approach.

CG Oh, very much so I still ring him up every minute of the day, you know, two or three times a week when I want a bit of advice about something, because he has a very good head on his shoulders.

MB And he took some of the work off shoulders at that time because he went and did some of the surgery that you would have otherwise been involved in with Wells, I think?

CG He did a session, reluctantly. No, he didn't really take any work off me. There would have been somebody else to do it. So he wasn't taking any work from me really at all. But he did Tuesday morning, I think it was, and as you know, I think I mentioned this once, I told you the story about him going into paediatric anaesthesia.

MB No. I mean you have privately before but not on the record yet. So we need that.

CG Yes, but before we do that we should talk about education in anaesthesia. Well, as soon as I started, we started about this. Well, there was a time... at that time the heads of departments of anaesthesia coming from America were the bosses, and they told all their junior, and indeed all their consultants, what they would do, or tried

to – the part-time consultants were not... So they didn't get any collaboration really. I was determined if possible to avoid this, but I knew the anaesthetic organisation for holidays and things like that was chaotic in the teaching hospital branches, and I felt something had to be done about this. So I drew up a scheme in which the top of it was the reader in anaesthesia, that was me, I wasn't a professor then, reader in anaesthesia, then all these branches out were the consultants and then their trainees. Now, the problem with the consultants... We worked out a scheme – which I can't remember the details of it – how this would work, the sessions they were doing, we would agree to, but we must know when they were going and they had to tell the boss or not the boss but reader or whatever or my office. I put this to what was called board of clinical anaesthesia, which was a committee of all the consultant anaesthetists, and several of them were great friends of mine, I might say, including John Hargreaves, who was at the funeral the other day. And it was going fairly well until a girl, woman I should say, called Fannie Ball, who was an anaesthetist at the Royal, part-time, one of these women part-time anaesthetists, but she wasn't bad really, Fannie. She said she would have nothing to do whatever to with this and that was it, she would resign. Then the others came in almost just like this, no they didn't think this was right, this wasn't going to be a regimented service at all, and the chairman must not think for one moment he is going to tell them what to do, because he wasn't, you see. We had a gorgeous slap in the face. I was a precocious so and so, and only a kid then because they were much older, much senior. So I went off and met Jack and we got together on the thing and we got the idea, which was absolutely delicious, of having administrative anaesthetists in each branch who were responsible for the service, not to report to me but if anything went wrong they were responsible. And they would be on the administrative advisory committee, this committee I was telling you about. And that worked marvellously for years. And it still goes on, and there is a chairman of the board of clinical anaesthesia now, which has all evolved out of it.

MB So, effectively, you have provided an administrative structure for the anaesthetics field in Liverpool.

CG Well, this would have come anyway, because it is all over the country now this thing. Then the other thing was we had to have trainees. I was very keen on teaching and I got the idea that it would be very good if they could have time off from study, from their work in the hospital, guaranteed time off, to come for lectures. And we mustn't have too big a class. So we started with twelve, and I persuaded the teaching hospital to give me - that was the branches of the teaching hospital, and two of the regional hospitals – to give me one SHO job, senior hospital officer job, which I could advertise and appoint. Now, that was a triumph.

MB Great step.

CG Oh, it was a triumph. I mean it was the hospital boards that really wanted to appoint these. But the administrative anaesthetists agreed, you see, yes they could let them off for one morning a week. So I started with twelve chaps for one morning, and of course Jack was again very helpful teacher, and I got the anatomists, they went for a time to the anatomy, and the physiologists, Gregory and so forth. It was good. And we had a journal class on a Saturday morning, it wasn't very popular, but they came. We advertised this course and the result was we got tremendous applications,

because nobody, just nobody was then making any effort to teach. They all went to Cardiff, and they were SHOs, but there was no solidified teaching and teaching by the anatomists, and the pharmacologists and so forth. And it [the course] was tremendously popular and we got the best people; people like [Alan?] Stead, who became assistant to... and [Ian] Geddes, who became my senior lecturer, until in fact, as they grew older they were all given appointments in Liverpool, in the region. As the region grew, these appointments became more important, and until one can say that very nearly, all the consultants in Liverpool had been through this course. But, it had come from more than one morning a week; it became one hour every morning a week and that made a very big difference. The consultant anaesthetists were very co-operative and saw that these chaps got the time off. Of course it paid them because they became better anaesthetists.

MB These were one-year courses that you ran?

CG One year. Twelve people to start with and it grew.

MB And Jackson Rees ran the physics teaching as well as the clinical end?

CG He ran the physics teaching, yes. And he did the paediatric work, as well. And of course he was very helpful in that we used to have discussions about research things. And I think, one of the things I think we both noticed was that when you were controlling respiration... I say both, Jack may argue with me, but I don't think he will. I think we both noticed that when you are controlling respiration the amount of anaesthetic you had to give was less with controlled respiration, as indeed was the amount of curare. So controlled respiration became a part of our pattern. No matter what the anaesthetic was, we controlled respiration for this. Jack, I think, wrote the paper I should imagine, I don't think I wrote it, it was a joint paper anyway on 'The Role of Apnoea in Anaesthesia.'⁹ And that was a big step because we gradually got the idea, you see, of anaesthesia being a triad... That was Jack's concept, the triad concept, where it was unconsciousness, we called it analgesia – freedom from pain – and the third one was muscular relaxation. That was our triad we worked on. Jack's invention was the triad. But when we got this apnoea thing it became a pyramid and the floor of it was apnoea, as it were, and it became a pyramid.

MB But it is so neat. It expresses what you were doing.

CG That's right. And the teaching... It is so easy to teach and to understand.

MB Cecil, I want to break in at this particular point, because your teaching went international quite early in that career in the forties. After that paper to the Royal Society of Medicine, I think you got invitations to go into Europe quite quickly after that, and you made real progress there; people got quite interested in the work in Europe.

CG Indeed, yes. 1946. Well, people came over from Europe you see, but the first big adventure was in 1946, just after the 'milestone' [paper], about June, from Belgium. And I was invited to go to four places: Antwerp, Lille, Liège and there is

⁹ In a letter to Max Blythe, Professor Gray made the following correction: the paper was entitled: The Role of Apnoea in Major Surgery, published in the *British Medical Journal*, October 1954

another centre in Belgium, I can't remember, and to go over there. Now, this was a time when you could only take twenty-five quid out of the country, you see.

MB Very tight, mm.

CG And there was to be no payment on this. I was invited and of course entertained, but no question of payment. Well, I was so thrilled to be invited, you know:

MB Yes, into Europe.

CG Also to teach the chaps, wonderful. So I thought, now how am I going to manage on twenty-five quid, you see. I thought I know, I'll ask my Dad if he would come with me. 'Oh, I'd love to come with you.' Well, that's fifty quid. Then Tony Gilbertson – Tony Gilbertson is now one of our senior, just closely retired, anaesthetists, who had been a member of the course – and his father and myself, roughly contemporary, he was a bit older than I. When I came back from the war I found my wife had got very friendly with a Mr and Mrs Gilbertson, that was Tony Gilbertson's father. So Mr Gilbertson was a great friend of mine, you see, by that time, and I asked him if he would come too, you see. So the three of us went off – seventy-five quid. And every night in the boarding house we would put the money out to see how much was left. I wasn't spending much because I was being entertained, you see. It was tremendous fun and I had one or two very very remarkable experiences. One of the best I think was in Liège. Am I talking too much?

MB No, no, we want all of this, nothing less.

CG In Liège there were two professors of surgery and one had been in the British forces throughout the war, and his name was Aubon(?), tall very British, Belgian, but very nice. And the other was the Frenchman; Liège is sort of French and Flemish, but mostly French. And the other was the Frenchman, Professor Christophe. Christophe was a little chap with a bald head and big pot and very pompous, and haugh haugh haugh, you see. So he did a gastroenterostomy, and I was to anaesthetise for this. And I did so and was squeezing the bag in the usual way and Aubon was standing here, and Christophe was doing his stitching up. And I noticed in the corner was a McKesson machine, which is an American machine for giving gas and oxygen on control, regulated percentage, and I said 'Professor Christophe, qu'est ce que c'est?' in my best-worst French. 'What do you usually use for an operation like this?' And he said 'Ah, Evipan, toujours Evipan.' Now, Evipan [hexabarbitone] is a barbiturate, a lousy anaesthetic, Pentothal was an enormous advance. It was the first real intravenous, Evipan, but the patients afterwards were restless and uncooperative, very difficult. And I said 'You do an operation like this with Evipan?' 'Toujours.' I said 'Evipan only?' 'Seulement, absolument, seulement, Evipan.' So I thought my God he must give a hell of a lot of Evipan, they must get a chest complication, with depression of respiration. So I said 'Do you get any chest complications?' 'Jamais, jamais, jamais, jamais. Avec Evipan, jamais.' So Aubon was standing here, and he tapped me on the shoulder, and he said 'Toujours.' It was great really.

MB I mean they had really held back by the war in Europe.

CG So that was my very first big sort of... In those days wherever you were invited, generally speaking, unless you were going down to Bristol to give a lecture, or whatever, although in Lincoln, yes, another experience, I had to demonstrate down there, in those very early days, but you were expected to demonstrate as well as talk. Now it is not legal, you can't do it so much.

MB. But there was an enormous need for Europe to catch up with the story, they were leagues behind.

CG Oh yes, and a big step was taken by the World Health Organisation, who had started teaching courses, and they started one in Copenhagen. And in 19.. I think it was '53, the BMA came to Liverpool, and of course the BMA runs a weeks exercise, and each speciality has its own meetings and so forth. And there was an anaesthesia section, and I suggested that Stuart Cullen from Iowa should come over, should be invited over because the BMA could pay, you see. He was a very nice fellow and he had written a tremendous lot in *The American*.¹⁰ But it was all again mostly on cyclopropane, just using curare as an adjunct, although he was a fraction more adventurous, I think, than a lot of them, certainly more adventurous than Griffith,¹¹ who started it all in Montreal. Anyway, Stuart came, a very nice chap, you see, and of course we had a few parties as you can well imagine, and he came and watched us giving anaesthetics, and he asked me if I would go over and take over Copenhagen, which he was... That is why he came, because he was already in Copenhagen.

MB You were telling me about that World Health Organisation project.

CG It was started by a man called Walters, Ralph Walters, who was the father of anaesthesia in America, a very nice man, and very able. He introduced cyclopropane into anaesthesia, and also absorption, carbon dioxide absorption, he was responsible for that. He was running the course, and he wanted to give up, and he'd asked Stuart Cullen to come over, Stuart being one of his boys, who was in Iowa. He came over and he asked me if I would take over, and it was October and it was damn cold in Copenhagen, it was miserable, a cold day in October. So I went over and I did I think two and half months there. That was interesting.

MB Yes. We are over running our story a little, so I am going to....

CG I did all the teaching and so forth, yes I am sorry.

MB I am going to pull you back a bit. All that enthusiasm in carrying us forward is fine, but I am going to have to pull you back, because this story of paediatric anaesthetics beginning to really grow from a Liverpool nucleus, I really need to know that story and we agreed to put that on the record.

CG Oh it's very simple.

MB Tell me how that all happened. Jackson Rees becoming involved in that.

¹⁰ The American Journal of Anaesthesia

¹¹ Harold R Griffith (1894-1985)

CH I had a fatality with a child, which I recognised because... in the Children's Hospital, which I wasn't normally attached to, but this surgeon I worked with – this was before I was appointed, you know, using curare and stuff – and I recognised I hadn't done the standard difference physiology between the child and baby. I really didn't want to do any more children in anaesthesia after that. And it wanted developing. It was terrible really at that time, the anaesthesia. And there was a very powerful lady called Isabella Forshall, who was appointed as surgeon at Alder Hey, which is a children's hospital. She developed the surgery there and she was doing obviously cleft palates and things like that, but oesophageal atresias on very tiny babies. And she was desperate to get good anaesthesia and she came one day to my room and she said, 'Cecil, I want you to give me somebody who can be trained as a paediatric anaesthetist.' So I said, 'Yes, well, yes,' thought for a few minutes and said, 'I have got the very chap for you.' 'Who's that?' I said, 'Do you know Jack Rees?' 'Jack Rees. I don't know, is he good?' I said, 'He is first class and extremely clever.' She said, 'Well, do you think he would do it?' I said, 'I'll ask him.' So Jack came in, you see, and we had a chat, and I said, 'Jack, Isabella has been in to see me and she wants somebody to develop paediatric anaesthesia, would you think of taking it on?' Jack was still my hundred pound a year... He didn't get that to start with, because he was a demobilisation... Oh, he might have got it as well, I am not sure.

MB But these were early months with you.

CG He was working very hard, yes. He said, 'I don't think so, I don't think so.' So I said, 'Well Jack you know, a big opportunity, and I really think you know, you really ought to do this, because somebody has to do it, and I can't think of anybody else who would attempt it.' I don't know whether he thought about it or not, anyway, eventually he agreed and he started, of course, and the result was world wide, as you know.

MB It was one of the great things to come out of your department.

CG Jack was?

MB No, this development of paediatric anaesthetics.

CG Oh, absolutely.

MB It must have been one of the great success events.

CG And there was the link-up, a link-up. And that's another important point, you see. The only row I ever had with Jack was over the link-up, really. They started doing operations, cardiac operations, and they did them at the children's hospital, and we had a cardiac centre, where I used to work for a time even when I was a reader. And we were developing refrigeration at that time and I thought that you wouldn't get enough expertise centred in two places in our region, much better to get all this concentrated in one place. That seemed to me very reasonable. So I spoke to Henry Cohen, Lord Cohen of Birkenhead, who was the kingpin of Liverpool at that time, and he said, 'That is what I am trying to do. I have got to organise this hospital service and of course that is what I would like to see.' So I talked to Jack about this, and Jack sort of hummed and hahed and he said he wasn't sure at all. The trouble was

I had missed the point that it wasn't just anaesthesia, it was all the backup. The pathology was different, children's physiology is completely different, I knew nothing about this, and of course Jack was learning. His first paper was on the difference between the onset of respiration, a brilliant, brilliant, classical paper. He has not written many, but those that are are classics, that he has written. Jack had studied straight away the physiology of the child, and went into it very deeply. That is really how he gradually built up from that, and he has been a wonderful, wonderful chap.

MB Just keeping to those years, you were talking of getting into hypothermia work, which is later in the '50s ... which takes you through a decade really, and more.

CG '50s, yes, '60s.

MB Staying though in the first phase of that department. Not only did you get a department to run, and you took on board people who were exciting, and you advanced anaesthetics in terms of teaching, and went into Europe, you also had to grapple with change that came with the new health service.

CG '48.

MB How did that affect anaesthetics?

CG Well, in a way it made it easier because these chaps were paid a proper salary instead of being honorary anaesthetists depending on private practice. They were then appointed to do anaesthesia, maximum, part-time, or full-time, and that made it easier, certainly. And of course the standards began to rise in anaesthesia, because we could vet the people that were doing it and make sure they had been trained.

MB So it removed that kind of honorary practice, replaced that kind of amateurism with a professional character.

CG That's right. It made all the difference. Of course there were a lot of the older chaps who had to be taken into it. The next thing was the foundation of the board of Faculty. I mean the Association was already going.

MB Running.

CG And I was involved in that and because I was involved in that I got involved in the Faculty.

MB That is at the Royal College of Surgeons. Yes.

CG Webb-Johnson, Lord Webb-Johnson was a president, and he was very friendly with a fellow called Marston, and they had obviously talked about this, and he was going to have a faculty of dental anaesthesia and in fact had got it almost going.

MB What kind of years are we talking about.

CG '48. Just before the... '48 the faculty was formed, first formed, I think. Could have been '47, but I think it was '48. Anyway, he got in touch with Marston and

Marston called a meeting of the Association of Anaesthetists and some of the London chaps associated with the (?), so it was quite a big meeting. He had prepared the way pretty well, because this was going to be a faculty in the College of Surgeons. The College of Surgeons at the top, and the anaesthetists underneath. So it took a bit... but because I was in office at the Association at the time, I was invited to their preliminary meeting. And the older chaps were much against this; they wanted the Association to develop on both the educational side as well as... and this was going to take, to an extent, the education off them. I remember speaking very strongly that we must have an equivalent qualification to the Fellowship in Surgery, otherwise we would get nowhere in the National Health Service. The only way we could get that would be a Fellowship in the Faculty of Anaesthetists at the Royal College of Surgeons, and that was my (?) contribution. And of course we did...

MB You were deeply concerned at that time that anaesthetics, people working in that field, might be a second grade discipline.

CG Absolutely. The National Health Service tried to make senior hospital medical officers, and only people with a DA [Diploma in Anaesthetics] could be a consultant and they made them consultants, and even some of the DAs didn't become consultants in the early days. They had to have a good record. And it was very important if we were going to develop the speciality that we were on the same lines as the surgeons and the physicians.

MB And you played a significant part in that?

CG Well, I didn't.

MB You supported that development strongly?

CG I supported it and spoke strongly but that was it. I don't know about a significant part in it, but when it happened it became different. Because I was on the [College of] Surgeons and because I think I made a fairly forceful speech, [Archibald] Marston asked me if I would to be on the Board of Faculty. When I got that phone call from the man he had chosen as his vice-dean – Marston was to be dean, you see – I couldn't believe it. This blighter from Liverpool, you know, I honestly really didn't believe it. I said 'The Board of Faculty.'¹² He said 'Oh yes, you will take it won't you?' And that is how it started, and I came up to... Ah yes, forties, the late forties.

MB The late forties, because in the fifties, you were going to do a range of jobs with national bodies, as well as a lot of travel and promotion of the field.

CG Well, all sorts of things developed.

MB But at that point, I am going to wind down for today. Thank you.

CG Thank you for being such a congenial interviewer.

¹² In a letter to Max Blythe, Professor Gray added the following information. Lord Webb-Johnson was a surgeon at the Middlesex Hospital and Bernard Johnson was his anaesthetist. Bernard Johnson, who was a friend of Cecil Gray, phoned him with the invitation to be on the first Board of Faculty of the Royal College of Surgeons. The Faculty of Anaesthetists was founded in 1948.