TRANSCRIPT OF AN INTERVIEW:
DAME JANET VAUGHAN DBE FRS (1899-1993) WITH MAX BLYTHE
Oxford, 4 November 1987
(MSVA 027)

Summary
Main subjects discussed: clinical pathology - diseases of bone and blood, 1930s investigations of pernicious anaemia, early blood transfusion services, UK, wartime and post-World War II medical planning initiatives, pioneering investigations of the metabolism of strontium and plutonium.

After discussing a family background including distinguished physicians and educationalists, Dame Janet Vaughan explains her choice of a medical career, pre-clinical studies at Oxford, clinical studies at University College Hospital London in the 1920s, and entry to clinical pathology. In this latter context she discusses early work on blood, particularly interests in pernicious anaemia and the influence of Cecil Price-Jones. How work on pernicious anaemia continued with Minot and Castle at Harvard in the early 1930s is also outlined, followed by discussion of the conditions she encountered as a woman specialist on returning to London hospitals. The initiation of wartime blood transfusion services is then considered, as well as several wartime and immediate post-war medical planning initiatives in the UK, after which Part 1 of the interview concludes with eyewitness comment on the nutritional dilemmas of those trying to assist the liberated survivors of Belsen Camp. Part 2 of the interview includes discussion of Dame Janet's return to Oxford as Principal of Somerville College, and continuing blood and bone research leading to pioneering studies of strontium and plutonium metabolism in mammals.

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Dame Janet Vaughan, DBE FRS in interview with Max Blythe
Oxford, 4 November 1987

Part One

MB Dame Janet, I want to try to trace with you today the lines of your career in medicine and science. I've heard you say, on occasions, that it was virtually predestined to be that way because of family background, in a way. Would you tell me something of that background?

JV Well, both my great-grandfathers were physicians. One of them was president of the College [Royal College of Physicians]. But then there was a skip, so that it wasn't perhaps so odd that I wanted to do medicine, though it wasn't really from an interest in medicine itself that I went into science. It was that I had read a great deal of history and I was very much concerned about social problems and the state of the world, and I felt it was no good just being concerned unless I had some background knowledge on which I could act and which would mean that people would listen to me. And it seemed to me that medicine was a good way of getting involved in real social problems. And, therefore... nobody listened to me at that stage in my career. I was at school and my headmistress said I was too stupid to be worth educating.

MB Oh, really. Where was this school? This is most unusual.

JV This was a private school, North Foreland Lodge, which was fashionable at that time.

MB Was this a school chosen by your father? He was an educationist.

JV Well, it was ... yes, chosen by my father and mother. It was evacuated to Malvern in the war, because, you see, I didn't go ... I had governesses, I didn't go to school until rather late in life. But then, as I say, I was too stupid to be worth educating.

MB In quotes!

JV So, it was rather a problem when I said I wished to do medicine. And I hadn't done any science at all.

MB What did your parents feel about that? They were quite supportive, though?

JV Oh, they were very supportive about me going to a university, very supportive. I don't think they realised what doing medicine ... My father was a schoolmaster, he ought to have known.

MB He was at Rugby?

JV They ought to have known that possibly I needed to do a little science. But the only science I'd done was a sort of botany, floral diagrams, you know, that the Victorians did. No real botany.

MB So what happened? You decided to come to university, but you had no...

JV Well, first of all I couldn't get through the entry to the university, in Latin and Greek.

MB Where did you apply? You applied Oxford, Cambridge?

JV I applied to Oxford. I applied to Somerville because I had links with Somerville, where wires could be pulled, I'm afraid. But Somerville said they'd take me, oblivious of the fact that I didn't know any science. But, you see, I couldn't get through. I didn't get through my entry to the university until Christmas, so I came up in a what they call a bi-term. I came up in January and started out on science and physics, a public danger in the labs. I'd never heard of an acid or an alkali.

MB And this was a way you could start in those days? That was quite acceptable?

JV Yes. It was not very usual, I think, but there I was …

MB And you had one or two goes at the entrance examination?

JV I got through the Latin and Greek at the third time, but I got through the science much more easily, all except physics. I had a little struggle with the physics?

MB Where did you get this teaching in preparation for it?

JV Oh, I didn't have any teaching till I came up to Oxford.

MB And you read and prepared?

JV I mean, except Latin and Greek. I didn't have any science teaching until I arrived in the labs in Oxford. A public danger, of course!

MB What did you find in Oxford? You liked Oxford from the very start?

JV Well, I loved the work. I found it frightfully exciting. It was such fun. And, of course, I was terribly lucky in my teachers. I was up in the golden period with Sherrington. I was taught by Jack Haldane and Julian Huxley.

MB Yes. Can't have been bad, can it? I mean, that must have been terrific.

JV I mean … well, I can remember, in the very early days, Jack Haldane showing me the Drosophila fly. You see, these were the days of when biological science was just …

MB Opening up, yes.

JV Yes. So I was extraordinarily lucky.

MB Yes. But the medicine career was very much in mind?

JV Oh, it was. I had to get through these basic sciences before I …

MB There was never a chance that the biological sciences would capture you entirely?

JV And I had to get through the physics, of course, too, before I could …

MB That can't have been easy! That can't have been easy, but you did.

JV I did.

MB And you eventually qualified very well, and surprised everybody.

JV I eventually got a scholarship to University College Hospital and was lucky, of course, I went, again, to University College Hospital in its golden days of Trotter[1] and Lewis[2], and …

MB That must have been a very special time.

JV It was a very exciting time.

MB And no more problems? You just went on in a fairly standard ... there were no more problems?

JV Well, there were no more problems, except that I wanted to be a physician and my mother died and I couldn't do enough basic house jobs. I only did one house job as a physician, so I had to become a pathologist. And what they called, in those days, a clinical pathologist, a race that really doesn't exist [now]. So I did all the blood counts and I did all the chemistry. I taught Sir Harold Himsworth how to do blood sugar curves. And I did all the bacteriology, under supervision, so that this was very fortunate for me because I got a basic view which, of course, no undergraduate gets today.

MB And this was still at University College?

JV This was still at University College.

MB What year was this, Dame Janet?

JV I'm so bad at dates.

MB This was early thirties?

JV Yes. Yes.

MB Obviously a very heavy and demanding job, with lots of routine work?

JV Oh, endless routine. And teaching, because my boss, who was the senior clinical pathologist, insisted on the students knowing their patients and so I used to take students on ward rounds. And at the same time I was lucky because I came into contact with someone whose name is now largely forgotten, Cecil Price-Jones, who was one of the first people who applied statistics, high powered statistics, to biological problems. And he was interested in the size of red cells, and he measured the red cells of pernicious anaemia, which had been a mystery disease, and compared them with the red cells of ordinary blood, and [that of] people with other diseases and showed that the size of the red cells in pernicious anaemia was unique and that you could produce what was known, and which will go down in history, as the Price-Jones Curve. So, as I was the clinical pathologist and saw all the blood slides, I used to take the pernicious anaemias and I learnt from him about the extreme importance of applying proper statistics to biological problems, which at that time was hardly appreciated.

MB Yes. But something which stayed with you your entire career.

JV And it's something which has just stuck, you see. And it has always been laughed at because I'm so bad at mathematics. I never could work out the sums.

MB But you knew the direction you had to take.

JV But I knew that you had to apply these very stiff techniques to getting the right answer to biological problems. And again, you see, I was fortunate in this because at that time Price-Jones was unique, I suppose. Now, of course, everybody thinks statistically.

MB Price-Jones was obviously interested in pernicious anaemia. You went on to take a much greater interest in this particular disease?

JV Well, yes, I became …

MB Was this where it started with …

JV Yes, I became very interested and, in fact, I read ... you see, I'd been trained at Oxford and I'd been trained to read the literature and I read that George Minot in the States was treating patients with liver and they were recovering. And so I arranged, with a friend who was a house surgeon, a house physician, and one of the sisters on the ward, to treat the pernicious anaemia patients with lots of liver, which was of course raw liver in those days or cooked liver. And to my joy their blood showed the changes which Minot had described, and the patients got better. And the physician, who was a senior physician - you know, an old-fashioned one in a tailcoat - used to demonstrate to the students how well they'd done on his arsenic.

MB They were on a treatment of arsenic?

JV They treated pernicious anaemia with arsenic in those days. And I knew it was due to my liver. So I went to the professor of medicine, Elliott[3], who had, I think, the first professorial unit in medicine, and said could I make some liver extract. Well, here was I, the junior pathologist, and Elliott said, 'Oh yes', and he gave me some money and said I could work in Harington's lab - Harington[4] was the great chemist - but that I must go and collect the mincing machines from my friends and the pails of my friends, because the hospital hadn't got any mincing machines. So I went round and collected mincing machines. I collected Virginia Woolf's mincing machine. Virginia was a cousin and I used to see a lot of her. And I collected her pails that her charwoman used. And I minced liver …

MB Night and day …

JV … with my Minot's book lying on the table telling me how to do it. And [I] produced some filthy looking stuff at the end of three or four days, and the professor of medicine, Elliott, said, 'Well, of course, this must be given to a dog, to see if it's safe.' So it was given to, taken over to Professor Verney, who was the professor of pharmacology, and given to a dog. The dog was sick! So then they said they must have some more liver, so I gave them a little bit more. The dog, the second dog was sick! So I said, 'Well, no, no more dogs. My liver is too precious. I've got a patient waiting for it. I shall take it myself.' So I took it myself that night, and the next morning, when I came back to hospital, there was all the professors - medicine, surgery, chemistry - waiting on the doorstep to see if I was still alive. I was fine and I

gave it to the patient and the patient recovered. He was a nice, old labouring man and his reticulocytes went up and up and up, and his blood went up, and he was fine. So after that I was put on to testing liver extracts which were then being made not by me, but by the MRC and reputable people. And, as a result of this, I collected a lot of data and I said I'd like to go and work with Minot in America. And the UCH people were very supportive and arranged that I should go out to Harvard. They got me a Rockefeller Fellowship and I went out to Harvard to work with Minot.

MB This was in the mid-thirties by now, was it?

JV This was in the early thirties, or very early thirties. Well, then there was a problem because Harvard didn't have any women.

MB This was not on? This was not allowed?

JV I was, you see, a Rockefeller Fellow. They couldn't say no to me, but I was a woman, so I couldn't work with patients; that was a problem. So I said I would work, I decided I should work with mice. So I ordered some mice from the stewards. The mice didn't come. So I went to the stewards and said, 'Why haven't my mice come?' 'Well, there aren't any Boston mice available.'

MB Oh, Boston mice?

JV So I said, 'Well, there are some excellent mice in Philadelphia.' And there was a very famous strain of mice in Philadelphia which I knew about. I mean, they were well known, these Philadelphian mice. 'Oh, but we've never had anything else but Boston mice in this department.' So there, I was, no mice! So I had to work with pigeons.

MB Quite a departure, yes.

JV So for six months, for a whole year, I worked with pigeons! But I learnt, of course, because though I couldn't treat patients and do ward rounds, I used to go to all the discussions, and I learnt a fantastic amount from Minot himself who was a great physician and a great teacher. And I learnt from Bill Castle, the other authority whose name is forever linked with B_{12}. So that even though I was reduced to pigeons, which incidentally about two years ago, Bill Castle, who remained a constant friend, produced a paper to prove that my work on pigeons had been the first test for vitamin B_{12}, though everybody had missed it at the time it had been published.

MB So he acknowledged this fifty years later.

JV But fifty years later, he published another paper to say that Janet Vaughan had been quite correct, and that her tests for pernicious anaemia on those pigeons … They were known as the bloody pigeons.

MB Dame Janet, can you tell me a little bit about that research because it is quite interesting? Can you tell me a little bit about that research?

JV About the …

MB The pigeon research.

JV Well, it was a question of putting different fractions, liver fractions, into pigeons and seeing whether they produced reticulocyte changes. And they did. But it's a complicated story. I don't think I'd better go into that now. But it's all been published. I mean, Castle, bless him, published it about two years ago. He sent it to the British Journal of Experimental Haematology, in which I had first published the B_{12} ... the pigeon story.

MB Right. So that was a nice fifty year on continuity.

JV Yes.

MB When you came back from America ...

JV I came, but they wanted me to stay, but I wanted to come home and be married. So I came home and was married. And I got a job as an assistant clinical pathologist at another hospital. And I didn't care for that because I wasn't allowed to do anything very scientific, and they were only concerned that my colleagues, my boss, was making money. And I did do quite a lot, and very successful private practice. But I just hated taking money from very poor people, when I used to have to go out when they were away. So my husband and I decided we'd rather be poor and happy.

MB Dame Janet, I think it would be rather a nice time to mention your husband. This is an important moment. You are now married with the marriage responsibilities and ...

JV Two children. Well, the children hadn't arrived at this point.

MB But married life and work at the same time. Would you say something about your husband?

JV He was in business. He ran a big travel agency, The Wayfarers Travel Agency, and was concerned largely with giving children a way to see the world. We lived in Gordon Square. All our friends were known as Bloomsbury, so we always said we knew where everybody was, and who they were with.

MB An interesting time to be in Bloomsbury.

JV So we had a really good life. I was doing work that I was interested in, because, by this time, I'd thrown up the Royal Northern Hospital and gone to work at the London Hospital, where there was a man who knew most about bone histology. I'd become interested in bones at this point in time because I'd found that there was a funny blood picture associated with bone disease, which we can now do a good deal to explain. But at that time, it had intrigued me.

MB Right. So this is where the link, blood and bone, came into your career?

JV So I went to the London Hospital to work with Turnbull[5], who was the only person, the only morbid anatomist, only pathologist, who knew about bones. He'd been trained by all the great Germans, and so there I used to work on the patients who had had bone diseases, and in the post-mortem room.

MB Looking at bones?

JV Looking at bones, with Turnbull. Somebody came to look for me one day, and went into the post-mortem room and said, 'Where's Janet Vaughan?' 'Oh, she's gone out on one of them filleting expeditions,' said the old PM porter.

MB You used to go out and collect bones from interesting cases?

JV I used to be sent out ... we used to get ... one of the physicians, Donald Hunter, used to get a lot of cases of abnormal bones, and I used to be sent out into the country with a lot of broomsticks to collect the bones from these odd cases to bring back to Turnbull.

MB Replaced them with broomsticks?

JV To look, to look at. So, 'She's gone out on one of them filleting expeditions.' And I used to bring the bones back. There was an awful day when ... it was a very hot day and I'd got half the skeleton, all the leg bones and the arm bones, and half the spine, and I just stuck at the skull, and I didn't get the pituitary, I was never forgiven by Turnbull. He went wailing round the hospital, 'Janet Vaughan didn't get me that pituitary.'

MB He was the ultimate perfectionist.

JV It was an in interesting case from the pituitary, because the pituitary very often is associated with bone disease. And so I worked at the London Hospital with Turnbull and Donald Hunter. I had my own outpatient clinic because I was concerned with anaemias, and it was the days of the ... of great poverty and unemployment. I used to find they had anaemias and I used to give them iron, and that cured them. Simple. Simple iron cured, not the pernicious anaemias, but some of the anaemias.

MB Were the people with pernicious anaemia still getting liver extract at that time?

JV Oh yes. But I was much more concerned with the very much commoner condition which was simply due to lack of iron which was simply due to lack of food.

MB This was commonplace in areas of poverty.

JV And the patients used to say to me, 'Don't give me any more of that medicine, doctor. It makes me hungry, and I can't afford it.' 'Can't afford it': day after day I used to listen to that. I used to be able to get extra milk for them. And I used to teach the people who came to my clinics that it was their duty to fight the authorities to get extra milk because of course to get them extra iron. This, you see, all drove home to me the social implications of medicine.

MB Which was in strong contrast to Bloomsbury, I mean, and yet this not very far away.

JV So, there I worked. But no one spoke to me at the London Hospital. I had a certain expertise. It was known now that I had a certain expertise about blood diseases and the physicians used to write and ask me to see a patient and give them advice, but they wouldn't speak to me. And I used to write back an answer, you see, and say what I thought the condition was.

MB This was being a woman practitioner?

JV Dorothy Russell, who was also a great pathologist, was also working with Turnbull. We were both at the London Hospital and we both had our lunch with the secretaries, but we never spoke to the physicians or the surgeons. Then, by great good fortune - I, by this time, was doing quite a lot of medical journalism, publishing my own papers and reviewing and, you know, well, medical journalism for the *Lancet*. And so I got to know Mrs. Kettle, who was one of the editors of the *Lancet* at that time, and through her, her husband, Professor Kettle[6], who was at that time professor of pathology at Bart's. And then he was moved to what they were starting, what is now known as the Postgraduate Medical School, which was being set up…

MB At Hammersmith?

JV And he rang up one day, rang me up, and said would I come as clinical pathologist at the new hospital? So I said that would be lovely if they'd give me a band saw to saw up my bones.

MB This was the condition?

JV This was the condition I went, that I got a very special saw for sawing up my bones. And he gave me a band saw. And, of course, here again I had luck because we arrived in an empty building, and Kettle had imported Ashley Miles, whom of course everybody now knows as the bacteriologist. He'd imported King[7] as the biochemist. He'd imported a less exciting morbid anatomist, and he'd imported me. And the four of us got together...

MB An exciting team.

JV …and supported by Kettle had enormous fun, setting up the new pathological set-up in an LCC hospital. And I was the clinical pathologist and there were some very good young physicians, and as I say, Ashley Miles, the bacteriologist, and we had great fun.

MB Great. Working with Kettle was good news, yes. You have happy memories of that.

JV And then people spoke to me, you see.

MB Oh, yes. And there's progress!

JV People said 'Good morning,' in the passage.

MB Terrific. What was the work there? Did it change very much? You were still working with bone. Did the work change a lot?

JV Well, I did all the clinical pathology. I mean it was all familiar stuff to me. And, of course, I had great luck because I had Kettle as a boss, and he imported as my assistant, first of all Gwyn Macfarlane, who is world-wide now known for his work on haemophilia. So I had Gwyn Macfarlane as my assistant and when Gwyn left and went to Oxford, I had John Dacie as my assistant. And John Dacie, you see, is now the most important haematologist. So I had, as soon as I got to the Postgraduate School, I had great luck.

MB This has taken us to the later thirties. We're now in the later 1930s.

JV This, yes, takes us to the beginning of... well, it takes us to Munich.

MB It does. Exciting things really did happen even on top of the ones you've mentioned.

JV So Munich ... do you want me now to talk to you about Munich?

MB Yes, please.

JV Well, we were told confidentially at the beginning of the week, Munich week, that there would be 37,000 - I don't know why that figure has stuck in my mind, but it has - 37,000 casualties in London might be at the end. So I thought ... I was responsible, you see, for the blood transfusion because in those days we used to have to match the blood. Well, I thought, 'If we're going to have 37,000 casualties, we shall want some blood.'

MB There was no blood?

JV Well, we shall want a good deal of blood. And I had made friends with a man in the Spanish Civil War, Durán-Jordà[8], who'd used blood for casualties in the Spanish Civil War. He'd come over to England with Trueta[9]. They'd walked out of Spain and Durán-Jordà came straight to me because I was a haematologist and because I was also involved in the Spanish Civil War. That's another story! And he taught me a good deal about storing blood. And I'd also read that the Russians were storing blood from street casualties. So when we got this message about the 37,000 casualties, I went to the dean of the medical school, who was a friend of mine, and said, 'I think I'd better have some money because I want some apparatus.' And the dean, being a man of, I think, enormous quality, gave me £100 in cash that afternoon! And I sent two of my assistants out in a taxi cab, and they went out and they bought glassware and rubber tubing and clips, which we thought we'd rig up ... rigs was the word, rig up some apparatus. And I had working with me at that time a very good South African clinician, a man called Guy Elliott, and he had a friend, a very senior friend at the MRC, and he collected the senior friend and we made up, invented sets with the rubber tubing which we'd bought, you see. And then we said, 'We'd better have some blood.' So we started bleeding everybody and putting the blood into storage. Then, of course, there were no casualties. And everybody said, 'The only blood that was shed at Munich was what Janet collected at Hammersmith.' Well, I said, 'Yes, but having collected all this store of blood we'd better learn about it.' And, fortunately, I had this very good physician, Guy Elliott, who was working with me, and we started using our store of blood in the hospital. And we used enormous quantities of it, and we wrote papers about stored blood and how satisfactory it was.

MB So these were very important foundation studies for the Transfusion Service?

JV We did know, at the time of Munich, we proved that stored blood, even primitive stored blood, such as we'd prepared could be used. Well, then some of us pathologists in the whole of London, people my age group, got worried and thought perhaps that even though Munich seemed to be safely settled there might be trouble later, and we'd better have some plans. So we used to meet in my flat in Bloomsbury, the pathologists who were all my sort of age group, people I knew, and we planned a transfusion service for London. No authority, but...

MB You just planned.

JV The children used to grumble about all the old bottles of London blood in the morning, because, you see, we had to decide what sort of bottles we'd use. Anyhow,

we made this great document and we knew that, I think it was Toppy - his name has gone out of my head; it'll come back. Topley! Topley was making plans for emergency services, so we ventured to send him our memorandum. Well, then the professor of pathology came to see me, and said I was a very naughty little girl! What was I doing, sending him that memorandum of ours. I said I was very sorry, you see. And you know...

MB Not the thing for a junior to do.

JV And forgot all about it. But then came a telephone message from somewhere in the Topley set-up, saying that they'd like this costed, this memorandum we'd prepared in my Bloomsbury room. And so then I went again to my friend the dean, and he said, 'Well, Janet, if you're going to cost it, triple every expense you put on. From my experience,' - and he'd been very high up in the Indian Military Service - 'things are going to be much more expensive.' So we costed this wonderful scheme: cotton wool so much, rubber tubing so much, and it went back to Topley. And then we were told officially that the scheme had been accepted and that we were to set up - which we'd proposed in our childish way. There was to be one at Slough, there was to be one at Maidstone, there was to be one at Luton, and to be one at Bedford. And we'd appointed ourselves as directors, on paper. And we were told to go and set up these units.

MB So you went to set up one?

JV And so I went down to Slough, and I went to the chief medical officer, who seemed to be the obvious person to go and talk to, who was a nice friendly man, and he sent me to the man who was head ... Slough, in those days, was a great trading estate; a pool of people, unemployed from everywhere, making all sorts of things. And a local man, a man called Mr Mobbs, who had a social conscience, had built a great social centre for the trading estate with canteens. And he said to me, well, he didn't think there was going to be a war, but he could give me some rooms and I could have my refrigerators put up. He didn't think there was going to be a war. So my big refrigerators were built and put up, and at the other units. And I was given some rooms, and I recruited some VADs and three days before the declaration of war I got a telegram from the MRC: 'Start bleeding', just like that. So I called in my VADs and I started bleeding. And now we were very fortunate, you see. Mr. Mobbs had been quite wrong when he'd said there was going to be no war. My big hall where I did all the bleeding was next door to the bar. Now, everybody said, 'Just like Janet to set herself up in a bar, isn't it!' As, indeed, it was. But how sensible. I could push the doors from the room where I did the bleeding into the bar where, you see, I could always call for people to bleed. I could also call for drivers. I mean, I had my own drivers, but by this time the world had learnt that if you were in trouble, you sent to Slough, and so I didn't always have enough drivers. And I can remember the night that Liverpool was hit. Liverpool rang up Slough, as people had got into the habit of doing, and said, 'Send us everything,' because the whole of their Blood Transfusion Service had been destroyed. So I went into the bar and said, 'Can anybody drive to Liverpool for me?' you see, and they volunteered. I had the vans, and so we loaded up the vans with all our extra rubber tubing and everything else, and up got somebody from the bar who would drive to Liverpool for me.

MB Excellent situation. Mr. Mobbs, a great help.

JV Well, yes. The social centre was an enormous ... I mean, it was invaluable. And it also ... the bar wasn't to be despised because when my drivers - most of them girls - came in... Because we used to go up to London in the blitz when people were

hit in London, or when we saw the bombs or heard the bombs falling on London, we just used to go up and say to the police, 'Where are the casualties?' And Slough would turn up. And they were just glad, you see, anybody coming in to help.

MB So you actually were dealing with casualties at the scene of …

JV We were dealing with casualties. I mean, we learnt … this was part of a long story which I've left out. We were learning about how to handle ... how to handle casualties because nobody ... shock was something quite different to what everybody thought it was.

MB When last we talked, Dame Janet …

JV We learnt that you had to give enormous quantities of blood, not just one bottle, five, six, seven. And so when my drivers came back it was very important for them to be able to get to the whisky in the bar.

MB Dame Janet, when last we talked, you told me a story that moved me greatly, about a girl and a direct bone transfusion.

JV Oh yes. That was ... we'd gone up one night to an incident, as they were called, on the North Circular Road, and there were a lot of casualties. And as we always did, I had to look at them and see which I could save and which I couldn't save if I transfused them, because this was the first job to do with casualties, was to transfuse them. So, on this occasion there was a little girl who was terribly badly burnt, and I thought, 'Well, she's done for. I'll leave her.' And I went, and we set up all the transfusions of the men and women that I thought I could save if they got blood, and then the surgeons would come. Then I went back to the little girl and she had been burnt, her arms and her legs, and she had no veins, and I thought I'd read that you could give blood into the bones. This was the great thing about medicine in the war, you could take risks because people died. So you were no worse off if they died because of what you did. So I took the biggest needle I had in my pack and stuck it into her sternum, her breastbone, and hung up a bottle and told my little VAD, who knew no medicine, to pump. And I had to go off to London to the MRC, there was some important meeting, so I left the little VAD, who knew nothing really, pumping. I came back a couple of hours later and the little VAD said, 'I've got two pints in.' Now, this was very exciting and the little girl lived. She came through. And she went down to McIndoe[10], you know, which was where they treated all the men for aircraft burns, and she was skin-grafted by McIndoe and she came through, and I thought no more about her. But we did two things. We arranged to have special needles made with flanges on them, because this needle that I stuck in might have gone right through into her chest, because it was a lumbar puncture needle. But needles with flanges on, so that they'd only go in so far, and then they'd stick. And these needles were made for the time of Dunkirk because then people could be transfused on boats, because, you see, on a rocking boat, to get into a vein was going to be very difficult. But on a rocking boat, you could hope to get into a sternum. So the needles with flanges were made so that untrained people could stick them in, and the transfusions could go. But the nice thing was many years later I was interviewing candidates for scholarships at Somerville, and I got a letter from a headmistress saying, 'I think you'll remember this little girl who's coming up for the scholarship. Look at her hands.' And I looked at the girl's ... asked the girl to show me her hands, and they were all skin ... they were little claws, they'd all been skin-grafted.

MB This was the girl?

JV She came up. She did very well. Got a good pass in the schools. And I've seen her since. She has a family of her own and is working.

MB Remarkable. Great satisfaction.

JV So nice things happened, you see.

MB Nice things happened. Moving on from that blood transfusion work which obviously had enormous importance, one or two other things happened in the war that also had enormous importance. I think you were slightly irreverent on one occasion, at a meeting of the Comitia of the Royal College of Physicians. Can I remind you of that?

JV Oh, the Royal College had discussions with you, in the war, to discuss the future of medicine, which was very right and proper for the Royal College to do. And I was at one of these meetings because I was interested in the future of medicine, and they discussed the future of medicine, they discussed the future of surgery, and they discussed the future of obstetrics. And I jumped up, without thinking, and said, 'What about social medicine?' and sat down again. Deadly silence! And afterwards, I was really ticked off by one or two senior fellows.

MB Not the thing for a junior to do.

JV 'A woman has never spoken in this Comitia before. And a junior fellow,' - and, you see, I was very junior - 'has never spoken in Comitia before'.

MB A great sin!

JV But Corkscrew Charlie, Charles Wilson[11], who was president of the College, was a very wise man, and he saw that social medicine at that time was beginning to be talked about. And he asked me if I and some younger fellows would write a memorandum for him on what we thought about social medicine. So I had many rebellious friends among the younger fellows, and some of us got together: Henry Cohen[12], who of course became a very important surgeon; Aubrey Lewis[13], the great ... who became the great psychiatrist, the new medicine of the world; a paediatrician, Lightwood[14], who was at St. Mary's at the time. And we wrote a memorandum as to what we meant by social medicine, and it was very inclusive and very long. And we sent this document to the president and the president accepted this document that these wicked younger fellows had produced. And the president - and this is something that counts to Wilson's greatness as president - set up a committee under Jimmy Spence[15] - now, Jimmy Spence was the great paediatrician at Newcastle - to study social medicine. And we met, this committee, with the president in the chair, also with Boldero[16], who was a high official of the College, always present. There were various students and fellows like ourselves, and of course Jimmy Spence. And we, the committee, produced a document, which must be in the archives of the College because it was a very influential document in the post-war planning on social medicine. And we also produced a document on medical education. We weren't the same group, but there was a lot of overlap. And those must both be in the archives.

MB These were very significant changes at the College of Physicians.

JV This, you see, was in the very early days of the planning of the future of medicine, of the health service. They were very influential documents, not only in the planning of the health service, but also in the thinking of the Goodenough Committee, which at that time was considering medical education. And I think that, as I say, it

was to Wilson's credit that he picked up that there was something that the younger people were concerned about, and it's entirely due to Wilson. And I'm sure that document, the first document, - because I, you see, never keep any papers - I haven't got a copy, I wish I had, that we sent to Wilson. And dear old (Boldero?), who was a very senior fellow, was awfully ... I mean, he'd been horrified by us! Perfectly horrified! But he listened, and he said to me at the end, 'You know, I really have learnt a lot.'

MB So that was progress. Dame Janet, I'm taking you on a step now. You were obviously deeply involved in the war, both at the College of Physicians and on the streets of Slough, and in bleeding volunteers. At the end of the war, can I ask how you came to be one of the first people into Belsen Camp?

JV Well, I was up ... the MRC was fussing about hydrolysates, and they'd asked me, because I was good at putting in needles, to look at our people who came back, released from concentration camps. They were coming back at that time. The war was still on, but they were coming back. And I was up with the MRC gossiping - because I used to go in and out of the MRC a lot - one day, one afternoon and two high up men from 21 Army Group were there, and they said they were worried about the starvation they were finding in the people in Brussels. And the MRC said, 'Oh well, there's Janet, she's good at putting needles into people. She'd better come with these hydrolysates'.

MB These were protein concentrates for people?

JV Yes. And the 21st Army Group said yes, I could come if they could put me into uniform. And Harry Himsworth was ill at the time and couldn't go. But he sent Rosalind Pitt-Rivers, who was a great biochemist, and Charles Dent, who was a young physician, and he was also a biochemist, and me. We went off by plane the next morning, in khaki, me with only a lieutenant's pips. I stayed with Drury at the Lister that night, and we sewed on the pips. And we went off by plane the next morning with nothing but hydrolysates in our luggage. When I got to Brussels, they showed me the starvation, and I said, 'These men aren't starved, they're perfectly well.' And 21st Army Group, and I can't remember who it was, said to me, 'We've just uncovered Belsen. Will you go?' And I said, 'Yes, as long as you don't tell the MRC.' Because we'd none of us had typhus inoculations, and we knew there was typhus. So they gave me a lorry, and Rosalind and Dent and I went round the labs in Brussels, 'liberating', that was the operative word, 'liberating the apparatus', because Rosalind thought she might need [it] for her chemical investigations. So we loaded up the lorry, and they said it would call for us at six the next morning with an armed guard. The lorry arrived at six o'clock the next morning, without an armed guard. They said they were short of men. So we climbed into our lorry, with our hydrolysates, which was the only luggage we had, and the apparatus that Rosalind had liberated, and we set out in our lorry. And we drove over the Rhine on wooden planks - there were no proper bridges - sitting in the back of our lorry, waving to everybody. And we drove up ... the lorry driver had what he called a 'movement order', and so we drove up to where we were to stay that night, we were to stay at some military establishment. When we got into the military establishment, I was lucky (to find?) one of my best boyfriends was already there, also with a lorry, but he had an armed guard. He was one up on us. So we stayed, we put up ... joined forces, and set out the next morning, two lorries, you see, mine with the hydrolysates, and Pat Mollison, who was going to some other ... on some other ploy, but on the same route, and up we went. And all the people were coming out of the prison camps in their striped pyjamas: a most extraordinary sight. We picked up with one Yugoslav who'd liberated a few eggs, and we shared our lunch with him. And then Pat had to go off to

a nice civilised hospital, and we had to go on to Belsen, without an armed guard. We knew we'd got there because of the smell. We could smell it before we got there. And we drove in and found the field ambulances, there was nothing there but a field ambulance. And the young man, the young commander of the field ambulance had heard we were coming, but thought we'd come to help him. So I said, 'No, I've come to use my hydrolysates. I'm not going to help.' And he said, 'Well, all I can do is to give you a room, and zwei Hungar.' The Hungarian Army was guarding the camp and so I was given two Hungarians and a room. And the Hungarians chopped up the furniture for us to light the stoves. You know, it was an army barracks and there were stoves that burnt wood. So the zwei Hungar were useful, chopping up the wood. And I went down that night to the horror camp, with the corpses and the whole mess. And then the next morning, we went out. They were bringing in the people from the horror camp into a great place where they were being scrubbed down by young German mädchen. And an English officer from the ambulance had to walk up and down to see that the German girls didn't ill-treat the patients. And all I could do was to pick - and I'd learnt by now, to pick fit people, not to pick the dying - to pick fit people, and to move them to my room and start to try and give them hydrolysates. Well, they were filthy tasting, filthy tasting stuff. They had no flavour, there was no flavouring, there was no milk, there was nothing, and so getting them to take it by mouth ... and then, if I wanted to give it to intravenously, 'Nicht krematorium. Nicht krematorium.' The Germans had been injecting them with paraffin so they burnt better.

MB No injections wanted there?

JV So it wasn't very profitable to try and give it to them intravenously.

MB What a terrible situation. But you found out that hydrolysates were of no great help.

JV Well, we found that they weren't any use.

MB So you were able to speak fairly strongly against their use?

JV When I came back, it was ... I was there, I suppose, till ... I didn't get back till after the end ... I was there over till after the end of the war, and I came back in charge of ... I flew back, it was very difficult getting transport. I flew back in charge of casualties, to somewhere in Wiltshire. You know, the casualties on the floor and me in a bucket seat. Nothing went wrong with the casualties, thank goodness. And I landed then somewhere in Wiltshire. And the place in Wiltshire sent me to Swindon, and I sat on the ... I telephoned from Swindon to my blood transfusion people to come and fetch me, and they found me asleep on the floor, picked me up, and took me back to Slough. And I got out of all my filthy old khaki. My hair was still full of DDT, you see, because of the typhoid. So I got out of all my khaki, just left it on the bathroom floor and hoped the children wouldn't get involved in it, and went up to London because I knew there was a meeting ... I don't know how I knew, but I did know there was a meeting of the people who were concerned with prison camps, because we were all concerned about the people coming out of Japan. And as I walked into the ... I went, on my way up to London, to my smart hairdresser, and said, 'Will you get the DDT out of my hair?'

MB But you put in, at this meeting, a strong plea for no use of ...

JV And so I went into the meeting with the DDT, at least, out of my hair, and heard one of these elderly professors talking, and saying how splendid these hydrolysates were, they were working, yes. And somebody said, 'Well, here's Janet

Vaughan, she's just back from using them in Belsen.' And I, you'll find it in the BMJ, I think, what I said, that the hydrolysates are no damned good. And what they wanted was milk and flavouring. And the next day, I went down to the War Office, and they cancelled the factories that were making hydrolysates.

Part Two

MB Dame Janet, after the war you came to Oxford, into Somerville College, as Warden?

JV I came as Principal, yes.

MB You came as Principal.

JV They suddenly asked me out of the blue. And our home in London had been bombed, and the thought of bringing up the children in Oxford was, you know, irresistible. And I thought that I could probably arrange to do some work.

MB Which you did.

JV Which I did. I ran an outpatient clinic until, oh, till '67, when I retired. A blood diseases outpatient clinic. And, fortunately, the MRC was at that time getting news from the States about all these horrible things like plutonium and strontium that were going to afflict the world. Apart from saying that they were about, the MRC wasn't told very much, the (McMahon Act?) was preventing real information coming through.

MB So there was a real embargo on information coming from America at that time?

JV But I was, you see, always interested in bones. And I had done a certain amount of work on radium for Rock Carling[17], who was an important person in the MRC in those days. And I was on one of the MRC committees when the problems of radium, strontium and plutonium were discussed, and it was apparent that nobody knew a thing about strontium. But, at that time, everybody was frightfully worried, because the milk was all contaminated from strontium from the Hiroshima bombs, and it was getting into the bones of the children. And so strontium was ... and nobody knew a thing about strontium and its metabolism. So I brightly said, 'Oh well, if you give me some money, I'll work on strontium.' Knowing nothing! And the dear MRC said yes, they'd give me some money. And Professor Burn[18], who was the professor of pharmacology who I'd worked [with] in the war, and who knew that, well, I was somebody who could work with, said he'd give me his basement kitchen in the department of pharmacology. And Dorothy Hodgkin found me a first class young chemist, who knew nothing about strontium. And I picked up a young physicist, who also knew nothing about strontium. And I collected one of my technicians who'd worked with me in the war and we set to work on the metabolism of strontium. And I said I hated small rodents, you know, I just didn't care for small rodents, and that I was going to work on rabbits. So I started work, putting strontium into rabbits, knowing nothing. We didn't even know when we started that strontium decayed to yttrium, which is the simplest fact, but we didn't know this. But anyhow, we started, and we, of course, got results. We couldn't help … it was pretty rough going, I think. But anyhow, we started and the MRC backed us, and people published us. And the University [Oxford] was very kind; it allowed me to build a hut to keep my rabbits in. And I used to say, 'I can't stay at Council [Hebdomadal] any longer, I've got to go and look at my rabbits,' rush out of Hebdomadal Council to milk my rabbits. I'd borrowed

a milking machine for rabbits from somebody because we had to determine what ... if you fed a rabbit... We didn't... you see, it was as elemental as that, we just didn't know if you inhaled or put strontium in intravenously, whether it went into the milk. Well, we had this sort of ... so we struggled along with the yttrium and with strontium, and we had great good luck because one day I looked down the microscope and I saw, as well as strontium in the bone, there was another radioactive material. And because I was a sort of maid of all work, you see, I'd stained these sections in a routine sort of way because I was a routine sort of person with a stain for sugars, and this other isotope seemed to be where the sugars were. So this was very exciting. So I went to the MRC again and they gave me some more money and we collected somebody who was knowledgeable about sugars, and we set him, poor Geoffrey [Herring], up to grinding bones because he seemed to know how to grind large quantities of bones. And Geoffrey, after six or seven years, was able to isolate the sugar from the bone that bound the yttrium. This, of course, had enormous scientific applications; I mean interest, quite apart from yttrium itself. And there again, you see, the MRC came up trumps. I wrote to Harry when we had finally isolated the sugar and said that, well, after, I think it was seven years, at least we'd found what bound the yttrium. And he sent me back another post-card saying that it had taken somebody else who worked for the MRC even longer to discover something, so why worry! They were, and are, a marvellous organisation. If they give you their trust, they leave you to get on with it.

MB And Geoffrey was quite remarkable as well. I'm forgetting his surname, but I have read some …

JV Herring. Geoffrey Herring. Well, he's put his mark on history because he isolated a whole group of sugars that nobody knew existed in bones. And poor Geoffrey, you see, just had to ... I mean, we sent him out ... you can imagine a chemist, you know, straight from doing high-powered biochemistry, sent to the slaughterhouse to get lots of bones and grind them up. I mean, we had a great time building grinding machines!

MB But you were seeing the deposition of radioactive material in bone?

JV We had seen that the yttrium, we assumed it was the yttrium, was taken up when there was sugar in bone.

MB And this was a progressive build-up? This was a high-retention build-up?

JV Yes. And so then we started, when we ... I won't say settled the strontium purpose, but done a lot of the strontium stuff, and we'd done the yttrium stuff, I thought I was so old that I'd die anyhow! I started working with plutonium because plutonium, you see, is very dangerous. I mean, it's terribly dangerous stuff. But we didn't know much about …

MB Plutonium, either.

JV Well, we knew something. The Americans weren't telling us. And so we started putting plutonium into the rabbits. And this, again, was extremely profitable because we were able to show that plutonium was also taken up in the bone marrow, and that plutonium was taken up by a certain ... quite different areas to the strontium. But this is all, you see, thanks to the MRC, who just gave us money and left us to get on with it.

MB But the outcome had important implications for those interested in leukaemias.

JV And it's still having implications. I'm terribly excited, a few weeks ago … some time ago, a colleague, John Loutit, who works at Harwell, and I had put strontium into mice, and we found a certain sort of result of strontium, which was not textbook stuff, it wasn't ... I mean, it did produce osteosarcoma, but it also produced other odd lesions, which we describe. And we had, in fact, a rider put into the official recommendations about tissues that had been injured by strontium. And a few weeks ago, reading in the library, I was delighted to find a report on the effect of strontium on dogs. You see, they'd taken a dog ... the mice died within three or four weeks. These dogs who had inhaled strontium hadn't died for ... six … twenty years. But the dogs had gone, just like my mice. And so this is the satisfactory thing about science, you see, that sometimes the answer is the answer that you get.

MB Dame Janet Vaughan, it's been my great pleasure to share these experiences with you. Thank you very much.

1. Wilfred Trotter.
2. Sir Thomas Lewis
3. Sir Thomas Elliott.
4. Sir Charles Harington.
5. H M Turnbull.
6. E H Kettle.
7. Earl King.
8. Dr Frederic Durán-Jordà.
9. Professor Josep Trueta.
10. Sir Archibald McIndoe.
11. Charles McMoran Wilson, Lord Moran.
12. Henry Cohen, later Lord Cohen of Birkenhead.
13. Aubrey Lewis, later Sir Aubrey.
14. Reginald Lightwood.
15. James Spence, later Sir James Spence.
16. Sir Harold Boldero.
17. Sir Ernest Rock Carling.
18. Professor J H Burn.