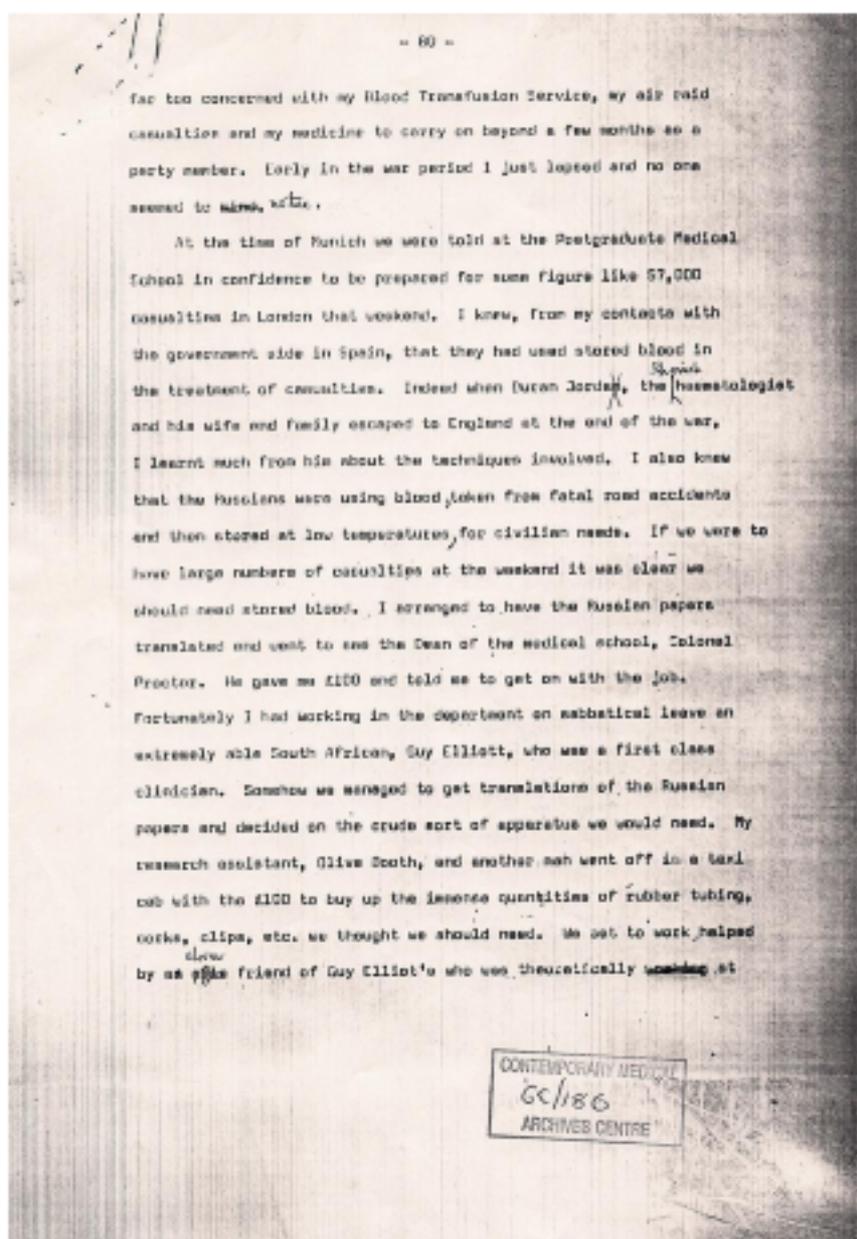


**DISPLAY ITEM 1:  
PERSONAL NOTES OF WARTIME EXPERIENCES (Pages 80-92)  
Contemporary Medical Archives Centre, Wellcome Foundation**

The original document of Dame Janet Vaughan's personal notes of her wartime experiences was produced by a typewriter and includes her own hand-written amendments. This thirteen page section (pages 80-92) relates mainly to 1938-1939 and concentrates on her work in transfusion. Because of the poor condition of the original document photocopy, it has been transcribed as it was originally written (grammar, punctuation and wording) and includes Dame Janet's hand-written comments and corrections. The document was originally obtained by Ms Vera Hanwright for Peter Howell and is quoted in his article on Dame Janet Vaughan.

Phil Learoyd  
BBTS Historian



Copy of page 80 of Dame Janet Vaughan's personal notes of her wartime experiences (Wellcome Foundation)

Phil Learoyd  
BBTS Historian

At the time of Munich we were told at the Postgraduate Medical School in confidence to be prepared for some figure like 57,000 casualties in London that weekend. I knew, from my contacts with the government side in Spain, that they had used stored blood in the treatment of casualties. Indeed when Duran Jorda, the Spanish haematologist and his wife and family escaped to England at the end of the war, I learnt much from him about the techniques involved. I also knew that the Russians were using blood, taken from fatal road accidents and then stored at low temperatures, for civilian needs. If we were to have large numbers of casualties at the weekend it was clear we should need stored blood. I arranged to have the Russian papers translated and went to see the Dean of the medical school, Colonel Proctor. He gave me £100 and told me to get on with the job. Fortunately I had working in the department on sabbatical leave an extremely able South African, Guy Elliott, who was a first class clinician. Somehow we managed to get translations of the Russian papers and decided on the crude sort of apparatus we would need. My research assistant, Olive Booth, and another man went off in a taxi cab with the £100 to buy up the immense quantities of rubber tubing, corks, clips, etc. we thought we should need. We set to work, helped by a clever friend of Guy Elliott's who was theoretically at Mill Hill with the Medical Research Council working on some bacteriological problem, but was persuaded that at that point in history storing blood might be more useful.

First of all we made large numbers of crude transfusion sets, and then we set about bleeding volunteers and storing their blood. As someone said later, 'the only blood lost at Munich was what Janet collected at Hammersmith'. Having collected large quantities of blood, however, Guy Elliott and I were determined to use it or at least some of it, in order to learn something about storing blood. A few months later Guy Elliott read a paper on the subject to the Royal Society of Medicine. It was also clear that though our Munich blood had not been needed the likelihood of war was very real, and that some plan should be made for the London area. A few pathologists, representatives from the ten London medical sectors and others interested therefore decided to get together and discuss possible arrangements. I have found a dusty old file which contains the minutes of those meetings held in our flat in Gordon Square. The first meeting was held on April 5th, 1939. We apparently decided that night that there should be four blood supply depots for London. One at Sutton with Dr. J.O. Oliver, from St Thomas's Hospital in charge, one at Bedford with Dr. H.F. Brewer from St Bartholomew's in charge, one at Maidstone with Dr. M. Marzals from University College Hospital in charge and I was to go to Slough. We looked at every sort of bottle. The children complained that the flat was littered with old bottles and we finally decided to use milk bottles for our blood because they would be readily available in large quantities and could be handled in milk bottle crates. For transporting our blood we thought Wall's ice cream vans might be valuable and of course it would be necessary to install large cold rooms for storage purposes. Further, we recognised it would be essential to enroll large numbers of donors and determine their blood group ahead of the declaration of war. I can always remember George Taylor of the Galton Laboratory, the English authority on blood groups, saying with great solemnity 'you must also enroll girls to determine these blood groups and this should be done at once; it is not easy to procure young girls'. We drew up a memorandum (as I had been taught by Ashley Mills & Co) incorporating these proposals and made some attempt at costing and listing all the materials needed, together with some question as to whether the depots should supply actual blood as well as group donors, and sent it off to Professor Topley at the London School of Hygiene who was known to be making official emergency war plans. We were of course completely unofficial.

A few days after I had sent our memorandum to Professor Topley, Professor Dibble, my boss at the Postgraduate Medical School came along to my room and told me I was 'a very very naughty little girl' (his words) to be busying myself with what didn't concern me. So that was that. However some days later came another message namely that Professor Topley wanted to see me and finally came news that the Cabinet had accepted the scheme, and please could proper estimates be provided. At this point the Dean, Colonel Proctor, an experienced administrator, gave me wise advice; 'At least double any figures you already have prepared'. We had fortunately made some estimates which I find in the minute book.

In the old minute book there is also a typed note headed Memorandum which I quote as a bit of history.

#### Telephone conversation with Professor Topley 13.4.39

"Professor Topley believes there will be no financial difficulty in establishing transfusion depots as suggested provided that an approximate cost of each depot can be supplied. Professor Topley is quite definite that transfusion officers will be expected to provide blood and not merely to group it. Professor Topley is anxious that arrangements should be made for blood centres with the blood probably already stored and ready for use before the emergency arises."

From this point the whole organisation of the depots was in the hands of an Official Medical Research Council committee rather than our informal group that met in Gordon Square.

We four originally self-appointed depot medical officers were however given instructions to go to our respective towns and make the necessary arrangements to set up a centre, acquire premises, metal cold rooms and prepare lists of donors. I well remember setting off alone to Slough to see the medical officer of Health with whom I had made an appointment. How fortunate I was to go to Slough where everyone - mad as I think they thought me at the time - was more than willing to help me. It had the enormous advantage of being in some ways 'a frontier town' in the American sense of the word. It had grown up after the first world war, round a vast new trading estate, full of migrant workers as we learnt when Professor R. A. Fisher and I studied their blood group distribution\*. There were no settled traditions and customs to be disturbed. The M.O.H. immediately said that the man I must see was Noel Mobbs, Chairman of the Great Trading estate and also of the remarkable social centre he had created. Noel Mobbs did not expect a war but at once said I could have my cold rooms, needed for storage of blood, built on some waste land at the back of the Centre, and if need arose I could have the use of one of the big halls at the Centre with its associated smaller rooms, wash rooms, etc. Further, that I could start approaching firms to enroll and group donors.

To help me in the task of grouping thousands of prospective donors in the early months of 1939 I used to take a Dutch pathologist, Dr. Van der Vries, who was working in the laboratory. He thought it all rather beneath his dignity and importance, but the experience stood him in good stead when he went home and was put in charge of the Dutch transfusion service. He survived to meet me after the war, but his beautiful wife and two little girls, friends of Mary and Priscilla, ended their lives in Auschwitz.

Through the summer of 1939 the work of organisation went on. We enrolled local Red Cross nurses to look after the donors and medical and technical staff from the different medical schools were allotted to the many different emergency services that were set up. My husband who had been a conscientious objector in 1919 wanted active service against Fascism, but was sent to the Ministry of Supply and spent his war in Glasgow as a civil servant. The children went down to Plovers Field with their devoted nurse Ivy. Three days before war was declared I got a laconic telegram from the Medical Research Council 'Start Bleeding'. The medical personnel drove the Walls Ice Cream vans with their refrigerators down from the Mount Royal Depot and our improvised organisation moved into action. That Sunday morning we stood in the Social Centre bar in our white coats with the locals, to hear Chamberlain state we were at war, and then went back to our bleeding. The Medical Research Council provided medical officers to actually do the bleeding of donors and later to study the problems of shock and treatment of casualties with blood products. At our peak we had eight qualified doctors and two qualified scientists to determine the blood groups of donors. Later the Royal Naval Blood Transfusion service joined us and provided us with a further medical officer and considerable personnel. For our large staff of V.A.D. nurses, secretaries, telephonists, technicians and extra drivers, however, we depended on the people of Slough and Windsor. They never failed us. We were about 100 strong and ran a 24 hour service with a doctor always on duty. Two local girls were trained to make all the sterile plasma and

serum, and sterile they kept it, in spite of the really unsuitable dusty conditions in which they had to work. I always remember Dr. R.B. Bourdillion, a high powered expert sent down by the Medical Research Council to advise us, looking regretfully through the glass windows of the "sterile room" where the plasma was being bottled by two pretty girls asking me if I could not persuade the girls to put his paraffin on their hair as well as on the floor and tables to keep down the dust. I pointed out that at least they were wearing caps. Paraffin might not have been good for morale.

The arrangements I had made with Noel Mobbs in the early months of 1939 for the use of rooms in the social centre proved ideal. There was a big workers canteen where the staff could eat and the bar was just across a narrow passage from where we bled the donor so in times of stress I need only go into the bar and ask for both donors and drivers. In the same bar my staff, my friends and I could nearly always get ourselves a stiff drink. In times of scarcity the barman always sent us a message if a bottle of whisky was opened. When the work load was suddenly heavy and drivers came home through the snow and the blackout, cold and weary, the bar became important and helped us to carry on. As someone once said, "Janet was the only person who had the sense to set up an Emergency Service in a bar".

We recruited in charge of our large fleet of Walls ice cream vans Mrs. E.O. Franklin's chauffeur Brady, a mad Irishman, but he kept the vans on the road. We also had two magnificent girl drivers who did the regular hospital rounds delivering blood and transfusion sets, and a number of voluntary drivers quite apart from those we called out of the bar in emergency, as on the night when Liverpool's blood depot was destroyed. We sent everything we had to spare in the way of equipment and blood up to Liverpool that night. One of our regular volunteer drivers, Lady Dunstan, must have been at least 70. She always wore several strings of pearls and a toque rather like Queen Mary, but she was never daunted. One day she came back in great pride from a Canadian military hospital somewhere in the country which had sent for urgent blood supplies. 'Yes the surgeon insisted on me coming into the theatre and seeing exactly what he was doing and why the blood was needed. I think I was able to help him', she said.

We had another remarkable old lady whose only interest in life before the war had been her string of ponies and her bridge. She came and said she wanted a job and we set her down among the young technicians to fix a singularly nasty wire filter that was being used at that time for stored plasma. This became her job, and when she was ill, as she sometimes was, she used to send her chauffeur in the Rolls Royce to fetch her a supply of filters to fit at home in bed. One of her friends said she had never been so happy in her life before. She knew we depended on her work, as we did, and through us casualties all over the country.

Blood transfusion in those early days of the war was very different from the service as it is known today. Only four blood groups A, B, O and AB were recognised. No one thought of the possible transmission of jaundice. Plasma\*\* and dried serum\*\*\* were still in the future. One or two bottles of blood per patient were usually thought sufficient but we learnt a great deal in four years. Flow fortunate we were to be working for the Medical Research Council. From the start the Council was insistent that its four blood supply depots were not only to provide a service but were also to carry on research. Some time in that first autumn London suffered a series of raids and we found it necessary as well as providing blood and apparatus for the casualties, to administer the actual transfusions ourselves. A hospital that received many casualties often welcomed help that came from outside. In the early days they would telephone for blood, but they soon learnt that Slough could hear and see the bombs falling and would arrive. The police, as we drove into London up Western Avenue or the Great West Road, could always tell us to which hospital the casualties were being taken. We learnt to carry an electric light with a powerful reflector to wear on our foreheads, the sort that ear, nose and throat surgeons use, so that if electricity failed or the lights were off because the windows were broken and the blackout curtains were blowing in the wind, we could still see to stick in our needles and hang up our bottles. When the first blitz was over Sir Edward Mellanby, secretary of the Medical Research Council, summoned some of the people who had been treating casualties to a conference to hear what had been happening. I was the only woman so I was asked first what my experience of treating wound

shock had been. This was extremely alarming because I was a pathologist, and in my experience the casualties had not at all fitted the classical picture of shock. Basically, I had found the wounded had high blood pressures not low pressures as we had been taught to expect. Also, we had learnt, especially in the case of severe burns, that it was essential to give many bottles of blood. So I spoke with great trepidation. I was delighted and relieved to hear two or three competent young men, good clinicians, who followed me say exactly the same. At this point an elderly physiologist sitting opposite could stand it no longer and leapt up, 'but in the classical description of shock it was said ...'. A very distinguished cardiologist from Guys, however, the only senior man present who had been out on the streets, supported us doctors from the depots. As a result of that meeting it was decided to attach to two of the London depots highly qualified young physicians whose job it would be to study the basic problems of shock and resuscitation. This of course was an enormous asset; we were well equipped to cope with our first real test that came at Dunkirk. By this time we had started to try and prepare plasma from the blood that could no longer be used for human transfusion. I had read about this and also heard of it by letter from George Minot in Boston, in those letters which came so regularly and which meant so much to us. This plasma however on keeping soon became cloudy and full of fibrin clots, so we were at first unwilling to use it.

We sent all the blood we had down to the coast for the first Dunkirk casualties that were landed. Then came still more casualties back to our country hospitals. We could not keep pace with the demand for blood. We knew men must die if we didn't transfuse them and so we took a risk on our very odd looking plasma. In war one had to take risks; and sometimes, in fact often, the risk won through. The plasma, bad as it looked, full of fibrin clots, worked like magic. Shortly after this I was called up to London to unpack a huge consignment of plasma sent from America under the 'Bundles for Britain' scheme. This unpacking was a solemn occasion carried out by Sir Henry Dale in person, with Alan Drury, Director of the Medical Research Council Transfusion Service. I was there to look on and later to broadcast our thanks to the U.S.A. authorities. What was our delight and amazement when the first bottle was lifted out of its crate, to find it as full of fibrin clots as our own. This was subsequently put down to sabotage at the docks. The problems caused by the fibrin clots led to the preparation of dried serum which, of course, from the point of view of storage and transport, had great theoretical advantages. Every week the plasma from the out-of-date blood had to be taken over to Cambridge where it was processed, and then brought back to us for clinical trial in the first instance. The early batches produced high pyrexia in the recipients. The Professor of Pathology at Cambridge, the redoubtable R.A. Dean, was sure this was due to the fact that the blood had been collected without suitable sterile precautions, so he himself collected and processed a batch. Alas, the pyrexia was even worse. This, as can be imagined, presented grave problems of protocol.

One night I was called out to a number of casualties in a small hospital off the Great West Road. I was also asked to look at a case of severe burns in a child, not due to enemy action. The burnt child had both arms and legs as well as her body badly burnt; there were no veins anywhere into which one could put a needle, so as one often had to in those days, I left her to die while I put up the transfusions for those I could hope to save. We set up several transfusions and then I went back to the child. She was still alive and I remembered I had read somewhere one could transfuse blood into the marrow. There was nothing to loose by attempting to do this. Death was the only alternative. I took the biggest needle I had in my case and shoved it into her sternum, hitched up a bottle, and told my V.A.D. nurse to pump, and left for a job in London. When I got back two hours later, the young nurse was still pumping and told me triumphantly she had got in two bottles. The little girl lived and was subsequently moved to the care of a plastic surgeon who gave her many skin grafts. Several years later when I was at Somerville, a headmistress wrote to me about one of the girls up for the entrance exam, and said perhaps I would remember her, especially if I looked at her hands. The hands were claw-like but useful, obviously the result of skin grafting. She came up to read English and did well in every way. After that night we had needles made for marrow transfusion with special side pieces to hold them in place so that they could be used

on aeroplanes and landing craft when it might be easier to get into a large bone than into an invisible vein.

We served ordinary medical needs as well as casualties due to enemy action. I was called one night by a general practitioner in a remote farm house the far side of Buckingham. He sounded desperate; he wanted me to come to a woman in labour who was bleeding heavily. He told me to go first to his house in Buckingham where I would get further instructions as to how to find the farm. I set off in the dark, called for my instructions in Buckingham, and when I came to the rutted lane, I found the whole village out lining the roadside with lighted candles to show me the way. I dashed upstairs to find a weak woman sunk in a huge feather bed, cold, sweating and deadly pale with the two doctors sitting silent and hopeless in the window. There was no vein to see or feel. I just stuck in my needle and hoped. "Digging for Victory" we called it when no vein could be located. Luck was with me, the blood went in and the emergency obstetric service arrived from Oxford as the woman's colour began to come back. When I pass that lane now, as I do sometimes on my way to Cambridge, I think of the lighted candles.

On D Day, as arranged, the loaded vans went down at dawn from Slough to Bristol, the army blood transfusion centre. They returned at mid-day with a camembert cheese brought back from France that morning. This was indeed the beginning of the end.

Perhaps the most important thing I learnt in the war was always to say yes to any call for help. What men and women need in desperate emergency is reassurance. They can hold on if help is coming and given the lead, other men and women will always be prepared to give that help. The people of Slough, the vary miscellaneous men and women who worked whole time and part time in the blood transfusion service, the medical students who used to come for a week at a time from Westminster and St. George's Medical Schools, the men in the Social Centre bar, all rose to every demand made on them with joy and pride. Sometimes the demands were pretty tough, but we always said yes. Just before D Day, Francis Frasar, Head of the Emergency Medical Services, rang me up, 'Janet we have made no arrangements for the Ports, will you look after them'. 'Yes, of course', I replied having no idea what looking after the Ports might entail. As so often we heard no more, but I can only hope that the Ports received reassuring messages that Slough would come if needed.

\* Fisher, R.A. and Vaughan, J. (1939). Surnames and blood groups. *Nature*, Lond. 144, 1047-1048.

\*\* The red and white cells of the blood circulate in a fluid known as plasma. This fluid carries with it an enormous number of important constituents such as inorganic elements in solution like iron and calcium, hormones, vitamins, and different proteins and glycoproteins. If blood is withdrawn into a container the blood will clot, by an extremely complicated biological process, and the fluid element now known as serum\*\*\* will separate from the mass of cells and can be syphoned off containing all the valuable elements mentioned above. Clotting can be prevented by the addition of a suitable anticoagulant which prevents clot formation. The cells then sink to the bottom of the container and the fluid, plasma, can be syphoned off.

Under some circumstances it is useful to be able to transfuse plasma or serum instead of whole blood. Whole blood is not usually kept for more than 2-3 weeks so it is economical to syphon off the plasma and use it in certain circumstances. Serum can be dried by complicated technical processes, and then redissolved for transfusion when needed. A dried preparation has obvious advantages over both whole blood and plasma as far as storage and transport is concerned. The use of both plasma and serum we learnt during the war; much of the necessary research work was done at Slough.