**Dame Janet Vaughan 1899-1993**
The Mother of English Blood Banking

**"Start Bleeding"**
**By Peter Howell**

It is clear from her earlier career history that Janet Vaughan was a forthright, energetic and idealistic lady of some competence who, having achieved a first-class degree in physiology at Oxford, finally secured a scholarship to the University College Hospital Medical School in London to study medicine, qualifying as a physician in 1924.

As someone motivated by a profound desire to use her medical prowess in assisting the underprivileged and victims of social inequalities, she was hardly going to succumb to the dictates of the establishment either medical or political. For a short period she was a member of the Communist Party and, not surprisingly, was a member of the Committee for Medical Aid to the Republican Government in Spain during the Spanish Civil War (1936-1939). In this capacity she became familiar with the work of Duran Jorda, a republican who pioneered the provision, distribution and use of stored blood to treat civilian as well as military casualties during this war. His experiences convinced her that in time of war it was essential to use stored blood taken and stored at strategically sited depots under controlled conditions rather than relying on donors-on-the-hoof who would be difficult to locate. In addition, such donors would unnecessarily distract and divert hospital resources totally pre-occupied in emergency surgery and treatment to cope with the many potential victims of aerial bombardment.

This clearly rational approach made commendable commonsense, particularly considering the efficacy of this policy as demonstrated in the Spanish Civil War. As the spectre of Munich loomed on the horizon in the summer of 1938 with the prediction of a possible 57,000 casualties, the time was ripe to put theory into practice to challenge the views of the establishment which, at that time, were naively insular, somewhat arrogant and certainly complacent (ref. 2 and 3). Using her persuasive powers she obtained money from her friend Colonel Proctor, Dean of the Post Graduate Medical School, Hammersmith Hospital (DI-1). This initially helped with the purchase of some basic items of equipment and, with the help of assistants and senior colleagues, including an excellent South African clinician, Guy Elliot, Janet Vaughan began the process of assembling the resources required to support a strategy of stored donated blood. For the best part of the next year there was a clear preoccupation with acquiring and evaluating a wide range of material, including bottles, glassware, needles, rubber tubing, etc., for use in the preparation of transfusion equipment.

Consideration was also given to the storage and transportation requirements in time of war. At first, the apparatus was somewhat crude but adequate to bleed donors in preparation for the outcome of Munich. In the event, there were no casualties, but the team took the opportunity to use this blood to demonstrate that blood stored following collection into anticoagulant was quite satisfactory (ref. 4) and no more likely to cause reactions than blood drawn into the same anticoagulant and used immediately. Furthermore, by the beginning of the war the prototypes of the equipment to be used in the transfusion service over the next three decades were in place.

However, the major challenge lay in persuading the establishment, the Health Ministry and Government to seriously consider a feasible strategy of blood provision in wartime. In the absence of any action by the powers that be by the winter of 1939, Janet Vaughan convened a meeting of pro-active like-minded colleagues to consider the resources and strategies required by London to facilitate blood provision in the event of a war (DI-2). The arrival of an exiled Duran Jorda greatly helped the deliberations at this time and by the meeting of 5th April 1939 a provisional scheme had been drawn up to provide London with blood for civilian casualties. This involved the creation of four well equipped blood storage depots strategically sited around London, each headed by a director and administratively linked to local hospitals. In classical Janet Vaughan style, the proposals were sent unsolicited to Professor Topley, responsible to the Government for organising emergency medical services. The plans were adopted on 20th April 1939 subject to satisfactory costings that were eventually agreed by the Treasury on 5th June 1939 (DI-3). It is documented that Duran Jorda must be given some credit for introducing the use of blood banks in the UK (ref. 5), but the irrefutable fact is that Janet Vaughan, in the face of considerable odds, ensured that in London the implementation was thorough and timely.

As war encompassed the UK and hostilities preoccupied the Government, transfusion medicine and science was about to experience a learning curve of immense proportions never before or since encountered. Quite apart from enthusiasm and dedication, it required fearless courage, tenacity and an ability to initiate innovations at a rate of knots. Janet Vaughan provided the perfect catalyst to generate, motivate and implement the changes in transfusion thinking and practice which emerged in this period. As a prelude to the war and with the help of like-minded people she had masterminded the development of the transfusion equipment requirements for blood collection, storage, despatch and delivery and had shaken the establishment out of its complacency to concede that her vision of blood banking for wartime survival was the only way forward. The summer of 1939 had seen immense activity in recruiting staff and equipping the four London depots, an organisation which by then was in the hands of an official Medical Research Council (MRC) Committee rather than Janet Vaughan's original informal group. However, as one of the medical officers in charge of a depot, in her case Slough, Janet Vaughan was in the thick of things as usual and ready for the so-called laconic telegram from the Medical Research Council, received three days before war was declared, '*Start Bleeding*' (ref. 6).

Even at a very early stage it was realised that the plasma and serum collected from donations could play a significant role in the treatment of casualties. Detailed techniques for the large scale pooling of plasma and serum in Winchesters was documented and implemented, and the criteria for sterile room provision were defined (DI-4). These guidelines formed the basis of the methodology of plasma pooling for the next thirty years. It was fortunate that the Medical Research Council were dedicated to not only ensuring that the supply depots provided a blood service but continued with research. The experiences in treating casualties, particularly in treating wound shock and burns, were beginning to challenge established medical practices. As the only woman present at an early MRC inquest into experiences in treating wound shock, Janet Vaughan had the daunting task of being the first person to explain that her findings defied the currently acknowledged classical picture of shock. Supported by other colleagues this facilitated resources to investigate the problem of shock and resuscitation. Innovations were nearly the order of the day. In one vivid recollection, Janet Vaughan recounts coming across a badly burnt child, so severely affected that it was impossible to find a vein for normal blood infusion. She recalled how it was possible to transfuse blood into the marrow. In a do or die effort

she selected the largest needle available, stuck it in the sternum and suspended a unit of blood to be pumped in gradually by a young assistant nurse. Notwithstanding the danger attached to the initial insertion, two units were successively transfused and the young girl survived to have successful skin grafts (DI-1). The outcome was that special needles were made with restrictive flanges and supports to facilitate marrow infusion at times, such as on aeroplanes and landing craft, when it might be difficult to target a vein.

War had ensured that, notwithstanding the many problems that had to be addressed in a rapid learning process, the value of blood in securing life in a wide-range of traumas and conditions had risen far above any previous expectations. Blood banking was here to stay and whether it be at special depots or within the hospital environment Janet Vaughan's views were unequivocal. Blood banks not kept under skilled medical inspection were likely to be a source of particular danger, hence it was essential, in her view, that all should conform to accepted standards and should only be sited at a hospital with a recognised blood transfusion officer (1943). By mid 1943, as it became clear that the tide of war had well and truly turned in favour of the allies, it was evident that consideration must be given to discussing the provision of post-war transfusion services. It was to this end that a significant meeting was held at the Ministry of Health (MoH) involving Alan Drury, Professor Francis Fraser (MoH) and the four directors of the London Depot in which it was emphasised that although the depots had emerged to cover air casualties the bulk of the work had involved the civilian sick. While it may have been perceived that Janet Vaughan, by recognition of the paramount role she had played in the evolution of blood banking, had risen to an elevated position in an establishment destined to secure a National Blood Transfusion Service, the nature of the lady precluded her from complacently endorsing a position that compromised her views. This is encapsulated in her letter of 28th January 1944 to Alan Drury, in which she soundly criticises the Ministry of Information Blood Transfusion Book of that time, in terms that could be considered caustic and to the point (DI-5). How well this was accepted and what altercations developed later we will probably never know, particularly as she seemed intent on burying the past when she made a vast bonfire of laboratory notes and records when she later moved from a large house to a small flat. However, it could be significant that later in 1944 she was replaced by Dr S. Shone and moved to pastures new.

On the other hand, there was no evidence of disharmony with the MRC, in fact, because of her infusion skills, her help was requested in treating war victims claimed to be suffering from starvation and dehydration. It was a challenge in social medicine she was hardly likely to refuse. Immediately prior to embarking on this mission she spent a day with Alan Drury carrying out last minute preparations, but no one could have anticipated the unimaginable horror of the inhumanity and level of human deprivation inflicted on the victims of Belsen. Of course, this was not part of the MRC agenda, but having examined prisoners of war in Brussels and declared they were perfectly well and not starved she was persuaded to travel to Belsen with her hydrolysates. If anyone could take this trauma in her stride it was Janet Vaughan and her conclusion was expressed in typical fashion. The hydrolysates were no damned good and what they wanted was milk and flavouring (ref. 7).

Shortly after, in 1945, Janet Vaughan returned to her earlier haunts to become Principal of Somerville College, Oxford, a post she held until her retirement in 1967. It also gave her the opportunity to indulge her obsession with bones, this time to study the incorporation of radiation products such as strontium 90 and plutonium, research that was well supported by the MRC to whom she was eternally grateful.

It is a curious anomaly that Janet Vaughan's impact on the development of blood banking in England seems to have largely evaded any floodlight of focus on the earlier 20th Century history of Blood Transfusion in this country. Certainly her role, amongst others, has been faithfully documented as one of the pioneers facilitating the emergence of the National Blood Transfusion Service at the end of World War II (DI-1). In fact, before the end of the war she was awarded an Order of the British Empire for this work, and in 1957 was made a Dame of the British Empire, suggesting that those in higher authority considered her contributions to medicine, science and humanity were significantly exceptional to merit such prestigious recognition. Of course, she indulged in a diversity of interests depending on her compulsions at the time. Her earlier work with pigeons, liver extracts and investigations on blood and bone marrow diseases contributed to the study of anaemia and resulted in one of the earliest British textbooks on haematology *'The Anaemias'*. Although she was a notable director of the London depot at Slough during the major portion of World War II, she was succeeded by Dr S. Shone in 1944.

Thereafter, she was involved in investigating the comparative value of hydrolysates, milk and serum in treating starvation victims at Belsen and subsequently she returned to an academic and research-orientated life-style as Principal of Somerville College, Oxford. Thus, although her period in transfusion medicine, and in particular 'blood banking', covered a critical time in the emergence of a transfusion service, it was not prolonged, covering only the period from 1938-1944 (ref. 1). This may provide one explanation why the phenomenal impact she had on the development of blood banking during the war years has never been fully appreciated to the extent that many workers in this field fail to recognise her name, never mind her contribution.

So it is that, notwithstanding and probably because of the many notable achievements of this lady, the acknowledgement of her contribution to the emergence of the service and blood banking as we know it to-day, has laid dormant for over half a century.

**References and acknowledgements:**


1. Gunson, H.H. and Dodsworth, H. (1996). Fifty Years of Blood Transfusion. Transfusion Medicine, 6 (Supplement 1), p12-13
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4. The Royal College of Physicians and Oxford Brookes University.
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6. Medical Sciences Video Archive MSVA.027.
7. Dame Janet Vaughan, DBE FRS in interview with Max Blythe, Oxford, 4th November 1987. p10 (4), p11 (6), P13 (7) (courtesy of Carol Beadle)


**Display Items (DI)**

**Contemporary Medical Archives Centre, Wellcome Foundation** (Copies acquired courtesy of Vera Hanwright)

DI.1 Personal notes of wartime experiences p80-92
DI.2 Emergency Blood Transfusion Service Sub-Committee, 24 April 1939
DI.3 Estimate of requirements of one Emergency Blood Supply Depot c.1939-41
DI.4 Notes on large scale preparation of serum and plasma
DI.5 Critical letter on Ministry of Information Blood Transfusion Book 1944