

## FAMOUS FIGURES

### Captain Oswald Hope Robertson

JSG Blair

It was Dr James Blundell in London who, in 1824, transfused four ounces of her husband's blood into a woman who had had a post-partum haemorrhage. This was the first accredited transfusion, although a Dr Phillip Physic had possibly transfused a patient in Philadelphia in 1795. Blundell, who trained in Edinburgh where he graduated in 1813, was certainly the person who introduced the transfusion of human blood on a scientific basis in England in 1818.

However, it was not until Karl Landsteiner, in the early 20th Century, described the four blood groups that the new treatment could become realistic and safe, and from then the huge specialty of blood transfusion science grew to its present status.

During the First World War, individual transfusions were given quite early, but these had blood collected from a comrade or nearby soldier. No blood bank was ever thought of, nor was blood collected in bulk, even before a projected major action (1).

In the later years, and especially, after the entry of the USA into the War in 1917, serious research and development was taken up. It was Captain Oswald Robertson (Figure 1), a doctor volunteer in the US Army, who built the world's first blood bank on the Western Front (Figure 2). While the current process was to transfuse by direct artery-to-vein anastomosis, or individual syringe or flask techniques, it was Robertson who built a donor and transfusion service which would be recognisable today (2). He collected blood from already typed universal donors by needle venipuncture through rubber tubes into glass bottles containing citrate and dextrose solution. He stored these bottles on ice for up to 28 days and carried them to CCSs where they were used. He personally administered blood to the wounded and showed that the procedure was safe and repeatable. He also taught other Medical Officers how to transfuse blood and soon many, many wounded were treated. He published his results in the British Medical Journal of April and June 1918.

All this did not just happen. Oswald Robertson was one of the many Britons whose parents had emigrated to the USA in the 19th Century. His father was an English Army Officer, and his mother Irish. Oswald



Fig 1. Oswald Hope Robertson.

was born in 1886 in England and the family went to the USA two years later. He grew up in California, in a town called Fresno. He did paramedical study in Berkley University and graduated magna cum laude from Harvard Medical School in 1915. As it happened, he began a research project under Dr Roger Lee, whose interest was in blood. Lee was one of the first to show that group 'O' blood, then called Moss group IV, could be used as the 'universal donor'. Lee at once recommended his young scholar for a fellowship and at the Rockefeller he worked with Peyton Rous, who with JR Turner, showed that rabbit red cells could be stored in a solution of citrate and dextrose safely for four weeks.

The USA entered the War in April 1917. Robertson was a member of the 5th Base Station Hospital which was made up of the Harvard faculty members and post-graduates who had volunteered to join the Medical Officer Reserve Corps. The 5th left for France in May, the first American Medical Unit to be mobilised. Lee was also one of its MOs. It was immediately attached to the British Third Army and its Surgeons began to work at once. As Robertson was not a Surgeon, he was assigned to investigate the treatment of shock.

Here again things worked out happily for

Dr JSG Blair OBE KStJ  
TD TAVRD BA ChM  
DLitt (honoris causa)  
FRCS FRCP FICS  
DRCOG FRHistS  
FSA(Scot)

World Vice President  
International Society for  
the History of Medicine

The Brae,  
143 Glasgow Road,  
Perth, PH 0LX



Fig 2. Transfusion team working in an underground bunker.

him. He had an Uncle who was a serving senior RAMC Officer. With his help, Robertson was given the opportunity to visit British CCSs to observe the effects of haemorrhage and shock. At once he saw the effectiveness of blood collected from the nearest comrade for transfusion. In June, a month later, he wrote to his senior colleague, Peyton Rous, suggesting that the Rous-Turner solution be used to store human blood until needed.

In September 1917 he sent Rous sketches of a planned blood collection apparatus containing a citrate-dextrose solution for use with group 'O' donors. By October he was drawing, storing and transfusing this preserved blood. In November, during the Battle of Cambrai, he built an ice chest from two ammunition cases, took 22 units of blood in it to the nearby CCS and used them to resuscitate Canadian Soldiers who were too shocked for immediate surgery. Nine of the twenty recipients survived.

Robertson worked under fire and on one occasion, when the British lines were overrun by the Germans, he barely escaped, having to leave many units of precious blood behind. He was awarded the DSO for bravery.

His work was recognised immediately. At once senior Generals and Consultant Surgeons, including General Sir Arthur Sloggett and Sir Anthony Bolwby, came to see the new apparatus. He was then tasked with training transfusion teams for the BEF, in a chateau behind the line. Friends joked with him of his easy number, but soon battalion transfusion teams became a regular feature, working in big underground bunkers (Figure 2).

After the War, Robertson went back to the USA and was then sent to China by the Rockefeller Foundation to supervise the setting up of the Peking Medical College. In 1927 he was appointed Professor of Medicine at Chicago University and continued to work in his field, both in research and planning. In 1958, eight years before his death, he received the Landsteiner Memorial Award of the American Association of Blood Banks. He died in 1966 in his retirement home in California, where he had studied migration of trout and salmon (2).

A remarkable fact ends this story. In the USA, blood collection for banks was forgotten and had to be re-discovered when America entered the War, but in Great Britain the system was not and at the outbreak of the Second War in 1939 a first-class system was at once in place in anticipation of air raid casualties and for the Armed Forces.

### Acknowledgement

I am grateful to Dr Paul Schmidt for his help and permission to quote from his memoir.

### References

1. Blair JSG. In arduis fidelis. Centenary History of the Royal Army Medical Corps,.
2. Hess JR and Schmidt PJ. Review in Transfusion, January 2000; Vol 40. pp 100-113.