History of Anaesthesia

The development of blood transfusion: the contributions of Norman Bethune in the Spanish Civil War (1936-1939)

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Although the Spanish Civil War (1936–1939) has been the focus of many papers in many countries, there are few references concerning medicine during this war, and many of the related events and medical progress are not well known. Some of these events came to influence civilian and military medicine. Among these were advances in blood transfusion, in which the Canadian surgeon, Norman Bethune, played an important role, particularly in advocating transfusion of blood to soldiers at the front rather than at medical centres behind the lines. While much of Bethune's work, especially in Canada and China, is well known,^{1–3} certain aspects of Bethune's work and his stay in Spain are worth reviewing.

Pendant la guerre civile espagnole (1936–1939), les techniques de la transfusion sanguine ont beaucoup progressé. Ces progrès sont dus en grande partie au chirurgien canadien Norman Bethune. Arrivé en Espagne dans le cadre d'une mission canadienne d'aide à la République, il a organisé en novembre 1939 un service de transfusions sanguines à Madrid. Bethune a vécu très intensément les épisodes de la guerre et, pendant son séjour, il a brillé par son sens de l'organisation et ses qualités humanitaires. Bien que son oeuvre

ait été d'une certaine façon mal comprise, la gratitude des autorités de la République lui a été conférée.

At the outbreak of the war, in July 1936, the Spanish Army lacked a formally organized blood bank, and consequently the need to improvise transfusion centres on both the loyalist (Republican) and rebel (right-wing Nationalist) sides was urgent. The Republicans organized a centre in Barcelona at the end of August 1936, under the initiative of the *Partido Socialista Unificado* (Unified Socialist Party) and directed by Dr. Federico Duran Jorda, and this centre became a model because of its medical care and research. The Republicans also had access to a department of transfusion in the School of Medicine in Madrid, directed by Professor Gustavo Pittaluga, which supplied blood to the Madrid front. For the Nationalists, General Franco's army organized the *Servicio de Transfusion de Sangre*, directed by Dr. Carlos Elosegui Sarasola, a hematologist. These three centres began operating almost simultaneously, in September 1936.^{4–6}

Norman Bethune (1890–1939) (Figure 1), who was born in Gravenhurst, Ontario and a thoracic surgeon in Montreal in the early 1930s, was a social activist who was drawn to the anti-fascist cause in Spain. Supported by the Canadian Committee to Aid Spanish Democracy, he arrived there at the beginning of November 1936. He immediately made several trips around the country, visited Republican army hospitals, and came into contact with several Republican authorities and the International Brigades. He then established, in a central street in Madrid, a blood transfusion centre, which he called the

Key words

Blood Transfusion, History, Spanish Civil War.

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Accepted for publication 27 May, 1996.

FIGURE 1 Norman Bethune, military surgeon (right) in Spain. (Note the inscription 'CANADA' on Bethune's uniform).

Servicio Canadiense de Transfusión. The centre's staff comprised Bethune and three other Canadians, one American and six Spaniards, two of the last being physicians. Bethune was commissioned in the rank of Major, and the physicians and medical students working with Bethune were appointed to the rank of Captain.

The transfusion centre started work without delay, and, aided by publicity in the radio and the press, it had 1000 donors on its books by the end of 1936. Each donor gave 500 ml., about eight procedures being performed each day. The blood was put into a bottle labelled with the name of the donor and the date of extraction (Figure 2), after which the bottle would be placed in a refrigerator at 1°C. The Service soon expanded, with control of three other centres in Madrid, Valencia and Jaen. In 1937 the staff numbered 100 and the donors, 3875, five cars transported the blood to the transfusion sites. An average of 100 litres of blood were transfused each month, and a total of 1900 transfusions were performed in 1937.⁷

Bethune visited other cities in the early part of the war, including Malaga and Almeria, and so saw first-hand some of the barbaric fighting by the Fascists on the Mediterranean coast. After he returned to Madrid, Republican authorities combined both transfusion services there in a single Institute, the *Instituto Hispano-Canadiense de Transfusión de Sangre*. Initially Bethune seemed to accept this, and he even went to Paris to buy material for the transfusion work, especially Jubé syringes, returning to Madrid in March 1937, when Franco started a new offensive against the city. But relations between Bethune and the Republican authorities eventually became strained, owing to the constant pressure they placed on him, and on, his part, impatience

FIGURE 2 Blood from Spanish donors in labelled bottles.

and independence and overindulgence in alcohol. As a result, Bethune left Spain in May 1937, soon to begin a new adventure: his work as a surgeon with the Chinese Red Army. That was his final adventure, for he died in China as a result of septicemia contracted through a finger injury sustained during an operation in October 1939.

Bethune's place as head of the transfusion centre was taken by Dr. Vincente Goyanes. He was later confined to a concentration camp, but he escaped, and a military court exonerated him. This meticulous physician gave Dr. Elosegui (head of the Nationalist army transfusion services) a detailed account of all the material and stock held by the Madrid centre, and in the first paragraph of the report he included the material provided by Canadian aid. In all, the *Servicio Hispano-Canadiense de Transfusión de Sangre* transfused about 5000 400-ml blood flasks, which, according to the Nationalist army, accounted for 78% of all extractions during the war.

In summary, Norman Bethune made a number of contributions to the development of blood transfusion during the Spanish Civil War. One was his organizational ability, at a time when the state of military health in Madrid was chaotic. Particularly notable was the mobile system he organized for attendance at the front, based on his concept of taking the blood to the wounded and not the wounded to the blood. This system was one of the first to be organized in this manner in any war. Always a humanitarian, Bethune went to the front himself, not hesitating to take blood to soldiers under enemy fire. For his work Bethune received the gratitude of the

Spanish authorities, and he was awarded one of the highest degrees presented to a foreigner during the war. The contributions of this Canadian surgeon to medicine in the Spanish Civil War were indeed exceptional.

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