

## Dutch Elm Disease and the Wicker Basket Theory

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Accepted for publication 6 May 1980.

The early history of Dutch elm disease in Europe has long been the subject of speculation. Staining resembling that caused by *Ceratocystis ulmi* (Buis.) Moreau has been observed in xylem rings dating back to the last century, but because other microorganisms can cause similar staining, this evidence is inconclusive (5). In North America there is a vague idea that *C. ulmi* might have been introduced to Europe with the Chinese laborers imported to dig trenches during the First World War. Horsfall and Cowling (10) have recently committed this story to print as follows: "They moved their meagre belongings in wooden wicker baskets made from the tough fibrous wood of the Chinese elm. Some of the pieces carried bark and the vector beetles. Presumably the fungus escaped into the low countries." No references are cited. With the help of the library of the Imperial War Museum in London, I have been able to assemble the following information:

In 1916 an acute manpower shortage existed in France and the Allies decided to follow a precedent established in the Boer War, and recruited laborers from China. By October 1916, 5,000 men, hired in Tien-Tsin and employed by the French Commission for Recruiting Manual Labour, were at work at various factories in France. During 1917, 5,000 more laborers were recruited by the French in Hong Kong and Canton, and another 20,000 in Nan-Kin (1,4).

The British carried out all their recruitment in Weihaiwei, a British concession in the province of Shantung. These recruits were formed into an organization called the Chinese Labour Corps, and the first contingent of 1,000 men left China in January 1917 and arrived at Le Havre in France in April. In the two years 1917 and 1918 the British brought about 100,000 men to Europe (6,13). They were kitted out in uniforms provided by the British and Gull (7) described the standard issue of 'bulging canvas knapsacks dyed a dark brick red'. Varied sea routes were sometimes taken to avoid the submarine menace (11), and Wou (13) described graphically how the men endured a 3-mo journey around the Cape of Good Hope, entombed in the hold 'sous un climat torride'. However, many of the Labour Corps contingents landed at Vancouver B.C., travelled by rail to Halifax N.S., and thence by ship to Liverpool in England. The average journey by this means took about 2 mo (6). Once in France, the laborers worked in various places behind the Allied lines which at that time ran from Dunkirk via Lille to Soissons (13), and after the Armistice they took part in salvage work (2).

What are the implications of this massive movement of men for the possible introduction of Dutch elm disease?

I have found no reference to 'wicker baskets,' but there were

wooden carts (7) and there may have been other items which could have possessed bark. It is unlikely that *C. ulmi* or elm bark beetles could have survived two passages through the tropics in a ship sailing round the Cape of Good Hope, but a winter journey via Canada would have been a different matter.

More crucial is the question of timing. The first laborers did not arrive in France until some time in 1916, and yet by 1918 Dutch elm disease was present not just in Picardy (8) and Belgium (3), but also in The Netherlands (12), a country which was not involved in the war and which was separated from northern France by a front line and 50-100 km of occupied territory. Traffic between the two areas was practically nonexistent. Moreover in The Netherlands, Spierenburg (12) stated that while attack in 1918 and later years was more common, some infection could be dated to 1917. Even if the pathogen was introduced with the first contingents of men, it is quite inconceivable for the disease to have spread so far so fast.

Thus, the wicker basket theory does not hold water! If, as some research workers think, *C. ulmi* did originate somewhere in the Far East (9), it is more probable that its arrival was linked with some earlier activity of man, perhaps in the course of trade or through the collection of Asiatic plants.

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