

Disease rather than military tactics was a major influence on Napoleon's downfall, as **Gavin Thomas** describes.

# Napoleon and typhus: a tale of two generals

History has been shaped by many elements beyond human control, and infectious disease must rank as the single most important of these. Warfare, with the particular stresses and strains felt by its combatants, is a human activity that is highly susceptible to intervention by our microbial cousins. This might not be immediately apparent in our schoolboy histories, which concern great generals and their feats of bravery and stratagem. However, if one digs a little deeper into the historical records, it is often epidemics that have made a major contribution to the outcome of conflict – often before the opposing forces have even set eyes on each other.

Napoleon Bonaparte was a great general, politician and leader of his people. He became ruler of France in 1799, being crowned Emperor in 1804, and then systematically conquered the majority of Europe, enjoying 10 years of astonishing military success. In 1812 he was at the peak of his powers, had assembled the largest army in the world with upwards of 500,000 soldiers and was about to embark on a well-planned assault on Russia. Two years later he had attempted suicide and had fled France. General Napoleon's downfall was due to many things, but as we will see 'General Typhus' was one of his most bitter opponents.

## A warning from the Caribbean

Napoleon had had at least one warning about the power of infectious disease in determining the outcome of a campaign, when in 1802 he sent his brother-in-law General Charles Victor Emmanuel Leclerc on an expedition to Saint-Domingue (now Haïti) to restore control over this French colony. Over the preceding few years a native general, Toussaint L'Ouverture, had created an almost autonomous state which had started from a slave rebellion in 1791 and the French wished to reinstate control by force.

Leclerc arrived with 25,000 men and, not surprisingly, quickly overwhelmed the natives and forced them into the interior. The French tricked Toussaint into agreeing to capitulate and he was shipped off to France where he quickly died, but when the French announced that they would be reinstating slavery, the natives, under the leadership of Jean-Jacques Dessalines, began another uprising. However, by this time the French forces had been absolutely decimated by yellow fever: 22,000 of them were dead by 1803, including General Leclerc. His replacement, Rochambeau, was defeated by Dessalines' forces at the Battle of Vertières, and in 1803 the remainder of the French force, less than 3,000 men, evacuated the island. Dessalines subsequently claimed the independence of Haïti and history notes this as the only



nation to have gained its independence from a successful slave revolt – but history should also note that a virus had something to do with it!

## The Grande Armée in Russia

The campaign into Russia was Napoleon's greatest gamble and ultimately led to the destruction of his Grande Armée and the breakdown of his empire. One of his stated aims was the liberation of Poland from the Russians and it was in crossing this country that his soldiers first came across 'General Typhus'. The quality of life in rural Poland at the start of the 19th century was not high; in the villages most people lived in hovels heavily infested with insects, and typhus had been endemic in Poland and Russia for many years.

The retreating Russian army had done its best to turn Poland into a wasteland during its withdrawal and the autumn of 1812 was unexpectedly hot,

meaning that water and other supplies were short. This environment provided ideal conditions for the spread of lice and subsequently *Rickettsia prowazekii*, the causative agent of epidemic typhus. The average French soldier was dirty and sweaty and was living in the same clothes for days on end, perfect for lice to find a home in the seams of his clothing. The excrement of the lice then contaminated the clothes and skin of the soldiers and even the smallest scratch was enough for the bacteria to infect the body. The soldiers also were sleeping in large groups in confined spaces and here the lice could quickly move to uninfected soldiers and deposit their bacteria-laden excrement.

A month into the campaign in July 1812, an incredible 80,000 soldiers had died or were incapacitated by typhus. Although the French army probably had the best medical and sanitary facilities of any in the world, it simply

▲ Napoleon (1769–1821) crossing the alps (1801). The Bridgeman Art Library / Getty Images

## Epidemic or louse-borne typhus

The causative bacterium of this disease, *Rickettsia prowazekii*, is transmitted between humans by lice. These become infected when biting affected people and pass on the bacteria in their faeces through bite wounds. The incubation period is 1–3 weeks and symptoms include high fever, headache and weakness; a rash appears after a few days. Complications leading to serious illness and death may develop, involving damage to the central nervous system, kidneys, heart and lungs.

Severe epidemics of typhus were common in times of war and famine; up until World War II, typhus claimed more victims on the battlefield than fighting, causing nearly 3 million deaths in World War I. Now lice can be controlled with improved hygiene and insecticides, and the infection treated with antibiotics.

*'Typhus, with its brothers and sisters – plague, cholera, typhoid, dysentery – has decided more campaigns than Caesar, Hannibal, Napoleon and all the inspector generals of history.'* Hans Zinsser

could not cope with this level of disease. Of course, they did not know that lice were transmitting the disease and so once the infected lice population was established in the army, they were impossible to get rid of. The soldiers were not able to change their dirty clothes or wash themselves and deaths continued at massive rates.

As Napoleon's army pushed further East, the Russians continued their retreat and lay-to-waste strategy almost as far as Moscow itself. It was only then that the French Army actually engaged the Russians, and even here, at the battle of Borodino, the Russians committed just a small number of their forces; the rest had retreated further into the East. Napoleon entered Moscow unopposed on 14 September, but with only 90,000 of his original force: typhus had claimed over 10,000 in the past week alone.

Napoleon had banked on Tsar Alexander I capitulating after the capture of Moscow, but Alexander had no intention of doing this and was able to play his trump card: the Russian winter. The autumn had been surprisingly mild and Napoleon jested with his generals that a Russian winter couldn't be much colder than one at Fontainebleau! Moscow was as poor in providing supplies to the French army as the countryside they had passed over in their journey from France, and despite an extra 15,000 reinforcements arriving during their month-long stay, about 10,000 of the existing soldiers died from typhus. Napoleon finally decided to leave Moscow on 19 October with about 95,000 tired, dirty and famished men. The retreat back to France is a sad story of disease, extreme cold and starvation and only 40,000 of



the original Grande Armée made it back, as few as 10,000 of them being in any state suitable for further duty.

Amazingly Napoleon managed to raise a new army of nearly the same size in 1813, but it was nothing like his original army of experienced veterans and almost half of this new army were lost to typhus in the same year, effectively halting Napoleon's plans for European domination.

### Bioarchaeology and the Grande Armée

In 2001, a mass grave of French soldiers was discovered in Vilnius in Lithuania, where parts of the army were garrisoned during the retreat from Russia. It was estimated to contain 2000–3000 bodies, and buttons were found from around 40 different French regiments. A group of scientists, led by Didier Raoult at the Université de la Méditerranée, Marseilles, has examined these burials and has been able to amplify DNA sequences from the remains of lice and from dental pulp from the soldiers' teeth. These identified the presence of *Rickettsia prowazekii* in some of the teeth (positive signals were found in 3 out of 35 different soldiers) as well as *Bartonella quintana*, the causative agent of trench foot, in some teeth as well as in lice.

That modern molecular techniques can provide support for the reports of French army surgeons written almost 200 years ago must provide unexpected evidence for historians of medicine. However, they are already well aware of the strong connection between microbes and warfare as succinctly described by historian Carole Reeves from the Wellcome Trust Centre for the History of Medicine, 'wherever there is warfare there is always infectious disease'. It is undeniable that Napoleon's career, like many other generals in history, was at least partly shaped by microbes.

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#### Further reading

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◀ French soldiers from Napoleon's Grande Armée suffering from typhus, lying in the streets of Vilnius. Tinted lithograph by E. Leroux after A. Raffet. Wellcome Library, London

▲ False-coloured scanning electron micrograph of a pubic louse (*Phthirus pubis*), a vector for *Rickettsia*. © Dennis Kunkel Microscopy, Inc.