HISTORY OF MEDICINE

Typhus and tyranny

Tilli Tansey ponders a turbulent history of vaccine research in Nazi-occupied Europe.

Lice thrive in war. Overcrowded conditions, the large-scale movements of troops and displaced persons, and the breakdown of rudimentary hygiene are ideal for the survival and transmission of body lice (*Pediculus humanus humanus*) and their sinister bacterial loads: *Rickettsia prowazekii*, the cause of the deadly disease typhus. In 1918, more than 650,000 cases of typhus were recorded in newly independent Poland alone.

As writer Arthur Allen relates in *The Fantastic Laboratory of Dr. Weigl*, it was this potent mix of geopolitical chaos and rampant disease that sealed the fates of two Polish biologists: Rudolf Weigl and Ludwik Fleck.

Weigl's laboratory in Lwów, Poland — now Lviv in Ukraine — is little remembered. But between the first and second world wars, it was a world centre of typhus-vaccine research. With government support, Weigl was the first to culture *Rickettsia* by harnessing lice as experimental animals. He devised an anal-inoculation technique to infect the insects with the bacteria, and marshalled human volunteers to nourish them. The typhus-engorged midguts of the lice were the raw material for vaccine production, and by the early 1930s the first reliable typhus vaccine was being tested and distributed.

In neighbouring Germany, Nazi propaganda associated lice with Jews, so in peace time there had been little interest in producing a vaccine. Priorities changed as the Second World War progressed and German troops first invaded, and were later defeated in, typhus-ridden territories in central and Eastern Europe.

In German-occupied Poland in 1941, Weigl's lab was put under the control of the Nazi armed forces. He and — elsewhere in Lwów — his former assistant, Fleck, were ordered to develop and produce typhus vaccines.

Weigl's lab became the town's intellectual centre, replacing pre-war cafe culture. Dismissed academics, many of them Jewish, applied to become louse feeders, earning a tiny monthly payment and wider protection from looters and attackers as stories circulated of clothes and homes crawling with lice. As the insects, in boxes strapped to the feeders' legs, sucked up blood, their nurturers would discourse on topics as diverse as mathematics,

Polish microbiologist Rudolf Weigl in his typhus laboratory during the Second World War.

philosophy and psychology. Feeders were trained not to scratch their irritated skin, to prevent infection — not of themselves but of the valuable lice.

Unsurprisingly in an institute in occupied territory, charged with producing life-saving medicines for the enemy, tensions arose. Weigl's scientific pride in producing a perfect vaccine contrasted with the desire among much of his staff to disrupt production.

It was a taut equation: if supply to the German army was seriously affected, the institute would draw unwelcome attention from the Gestapo, who might close the lab, or take it over. The vaccine workers continued as best they could. Occasional subterfuges created suboptimal vaccines, and a deal allowed a small amount of vaccine for

private use, which, it is claimed, found its way to Warsaw's Jewish ghetto.

Fleck was in a very different situation. As a Jew, he was consigned to the Lwów ghetto after German occupation. He was arrested in February 1943, and thereafter worked in labs in concentration and extermination camps, under the direct control of the SS. At Auschwitz and especially at Buchenwald, he and colleagues devised another solution to the problem of working for the enemy. Fleck cultured *Rickettsia* in experimental animals, mainly rabbits, and then harvested the animals' lungs. From these his team manufactured a useless vaccine. Untrained co-workers and ignorant SS supervisors unknowingly supported the pretence.

After the war, the new world order in Poland treated both men harshly. Despite being appointed to a university chair in Krakow, and offered vaccine-making facilities in Moscow, Weigl found his Nazi associations and refusal to become involved with the socialist regime damaging. He died, broken and forgotten, in 1957. Fleck worked in Lublin and then Warsaw, increasingly subject to anti-Semitism. In the year of Weigl's death, he emigrated to Israel, where he worked in bacteriology until his own death in 1961.

Perhaps Fleck, now known for his 1935 *The Genesis and Development of a Scientific Fact*, was bold in attempting his large-scale deception. But was Weigl, when he extended a warm welcome to his new German masters, being a disinterested scientist, a subtle subversive or a genuine sympathizer? Allen argues for heroic rebellion, citing Israel's recognition of Weigl with an honour awarded to those who risked their lives to save Jews during the Holocaust. That view has been challenged by historians such as Paul Weindling, and even Allen's own account is at times ambiguous.

The book's style and purpose are perplexing. It has some of the trappings of an academic work, such as multi-language references, but words such as "claptrap" jar with the predominantly scholarly tone of the text. All in all, however, fascinating stories emerge. ■

Tilli Tansey is professor of the history of modern medical sciences at Queen Mary, University of London.
e-mail: t.tansey@qmul.ac.uk

The Fantastic Laboratory of Dr. Weigl: How Two Brave Scientists Battled Typhus and Sabotaged the Nazis
ARTHUR ALLEN
W. W. Norton: 2014.

EAST NEWS POLAND