

Life-Saving Epidemics: Typhus and Karma in WW2

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Introduction

World War 2 (WW2) began in Europe with Nazi Germany's invasion of Poland on 1st September 1939. As the Nazis commenced blitzkrieg warfare against the Poles, the Soviet Union began offensive actions to take East Poland, utterly crushing the country of Poland. Perhaps in the greatest miscalculation, the Nazis subsequently invaded the Soviet-held territories, singlehandedly unleashing the largest theatre of war of any kind in history, eventually reaching the outskirts of Moscow.² The following years of war in Europe will see many military defeats and takeovers by the Nazi regime, further deteriorating living conditions in many parts of Europe.



Figure 1 - Operation Barbarossa

At the core of Nazism were antisemitism and discrimination. Labels such as “sub-humans (*Untermensch*)” were used by the Nazis on the populace deemed inferior.³ Massive extermination and concentration camps were erected by Nazi bodies such as the *Schutzstaffel* (SS) and the *Gestapo* throughout the occupied territories.⁴ The facilities were built to enable the Holocaust, a systematic genocide programme targeting the discriminated, which included Jews, homosexuals and people with disabilities, just to name a few.

With filthy and crowded living conditions, these concentration camps were hotbeds for diseases and infections to spread. Sure enough, with the outbreak of war in Europe, coupled with the rise of

militarism in the German society, an epidemic of a bacterial disease known as Typhus began to rage across the continent.

The Typhus Disease

Typhus is a bacterial disease caused by the *Rickettsia* bacteria.⁵ The disease has three forms, endemic, epidemic, and scrub typhus.⁵

Disease	Species	Vector	Reservoir
Epidemic typhus	<i>Rickettsia prowazekii</i>	Lice	Humans
Endemic typhus	<i>Rickettsia Typhi</i>	Fleas	Rats
Scrub typhus	<i>Orientia tsutsugamushi</i>	Mites	Rodents

Table 1 - Comparison of Typhus

The common symptoms are chills, fever, headache, muscle aches, and rash.⁶ Epidemic typhus has more severe symptoms such as confusion, coughing, nausea, and vomiting.⁶ One gets infected with typhus when parasites such as mites, fleas, and lice bite.⁷ Bacteria-laden faeces are then left on the skin, and it gets into the bloodstream through an open wound from scratching or any other cuts on the skin.⁷

Although endemic typhus is far less dangerous and were seldom fatal, epidemic typhus has a mortality rate as high as 40% when untreated.⁷ Typhus epidemics occur when many people are living in close proximity in unsanitary conditions.⁷

The first written record of typhus was from 1489, during the Spanish Army's siege of Granada, Spain.⁶ In it, symptoms such as high fever, rashes, delirium, and gangrenous sores were noted.⁶ During the siege, approximately 3000 soldiers lost their lives in the line of combat, while 17000 soldiers lost their lives to typhus, cruelly demonstrating the killing potential of typhus if left untreated.⁸

Napoleon's defeat when he invaded Russia was partially attributed to typhus, an ominous prophecy to Hitler's war against Russia a century later.⁸ With such a long history, endemic typhus is often considered to be native in Europe, with occasional epidemics caused by exigencies such as war. Typhus hence has the nicknames "war fever" and "military fever", suggesting an association between the disease and wars.⁸

Typhus in the German Society

It is therefore not surprising that typhus raged through war-torn Europe, where soldiers fought, had meals, and slept together on the gruesome frontlines. As the war effort carried on in the face of both the visible and invisible enemy, the Nazi propaganda machinery began to push the narrative that the Jews were responsible for typhus and other infectious diseases.

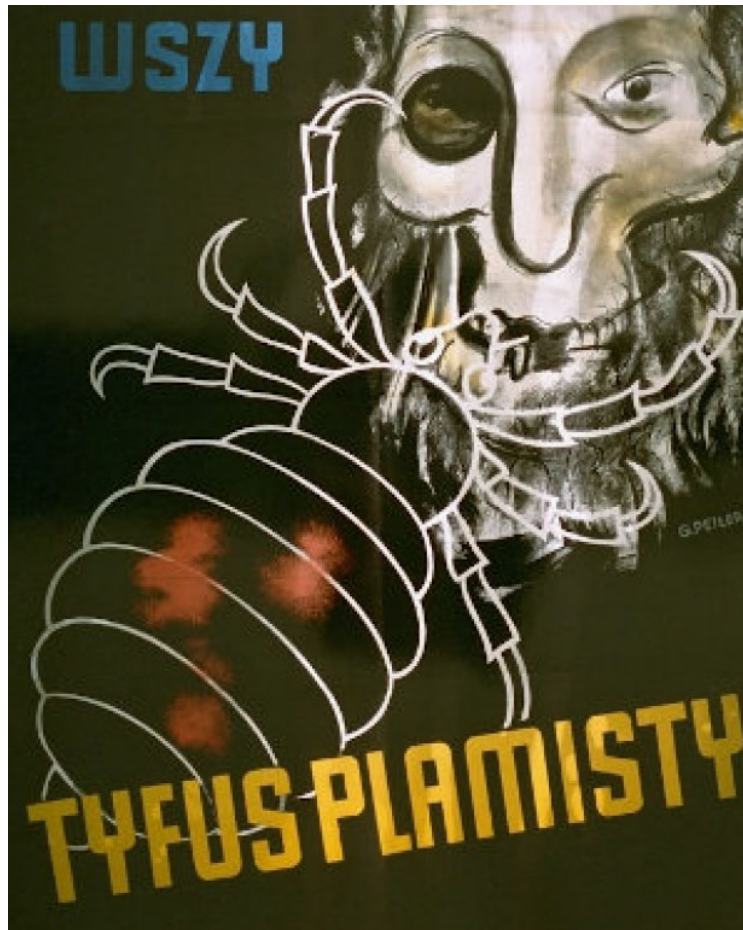


Figure 2 - Propaganda Poster Distributed in Poland in 1941 (Accompanying caption: "Jews are lice; they cause typhus")⁶

As a result of this smear campaign, the Nazis gave themselves legitimacy in their confinement of Jews. In November 1940, the Nazis kept more than 400,000 Jews in a 3.4-kilometre square ghetto in Warsaw, Poland.⁶ With the serious overcrowding and unsanitary conditions in the ghetto, typhus infected 100,000 people and killed 25,000.⁹ Seeing how deadly typhus is, *SS-Obergruppenführer* Reinhard Heydrich, who would later become the principal architect of the Holocaust, ordered SS medical chief to induce a typhus epidemic in the Warsaw ghetto to murder the surviving Jews.¹⁰

Rudolf Weigl

Rudolf Weigl (1883 – 1957), a Polish microbiologist, was stationed near Lvov, Austria-Hungary (present-day Lviv, Ukraine) working in a laboratory that is working to control typhus.¹⁰ During the first world war, he enlisted into the Austrian army and was delegated to parasite research, which developed his interest in typhus.⁹ After the discovery of the infection mechanism of typhus by Charles Nicolle in 1909, Weigl grew infected lice in his lab in an attempt to produce a vaccine to be used against typhus.¹¹ By 1933, he was able to scale up the production process to include human testing.¹²

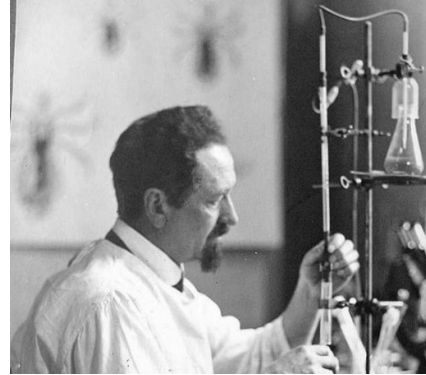


Figure 3 - Professor Rudolf Weigl¹

He would grow healthy lice in small cages, strapped to a person's legs, to allow them to feed on the humans.⁸ With as many as 40 cages strapped to a leg, a person could feed about 25,000 lice a month.⁸ Once the lice were grown, he would inject the typhus bacteria into the lice.⁸ After the lice were infected, Weigl would allow the lice to feed on humans who were inoculated with his early vaccines, before grinding the midguts of the lice into a paste, to be used as a



Figure 4 - Cages Strapped to a Feeder's Legs²

vaccine.¹¹ Weigl even contracted typhus himself through this process but recovered.⁸ Though never specified, Weigl's recovery from typhus could be the result of him inoculating himself with his creation.

Because of his work on developing a vaccine for typhus, he was later awarded many accolades and was even nominated for the Nobel Prize.⁸ On his political views, Weigl was noted to be an opponent of fascism, putting him at odds with the rising Nazi movement in Europe.⁸ This could have influenced his decision to use his research work to save people from being persecuted by the Nazi state organs.

During the outbreak of the second world war, the German High Command permitted the works of Weigl to continue. It was due to the Nazi's fear of a typhus epidemic in the Army, which would wreak havoc in the fight against the Allies.¹³ This created a golden opportunity for Weigl to use his research as a front, to secretly save the lives of Poles and Jews. Weigl's laboratory developed technology for large-scale vaccine production and hired countless Polish scientists, laboratory technicians, and even artists, all under the pretext of developing the vaccines the Nazis so desperately needed.¹³ Under the

pretence of experimentation, Weigl had most of his Polish compatriots inoculated with his vaccine. Some of them worked directly under Weigl in the push for vaccine research, while others worked for him as lice feeders.¹³ His staff were granted a special certificate that gave them protection and food aid.¹³ This was vital during wartime supply shortages and helped to preserve the resistance movement. This close-knit community of Poles created favourable conditions for coordination between the Polish resistance movements – directly under the nose of the Nazis.¹³ Weigl even smuggled vaccines into the Jewish ghettos, under the same pretence of needing human subjects for experimentation. Weigl was held in such high regard by the Germans that his refusal to succumb to Nazi ideology did not negatively influence his research in any bit.¹⁴

Rudolf Weigl After the War

Throughout the war, Weigl saved an estimated 5000 people from the jaws of the *Gestapo* and *SS*.¹³ Despite his humanitarian work during the war, he was denounced by the Soviet Union for collaborating with the Nazis, denying him of his Nobel Prize in the process.¹³ With the rise of the Soviet Union's influence in Eastern Europe, his name never fully recovered, and he moved to Krakow, Poland after the war.¹⁴ He continued his work in the Jagiellonian and Poznan Universities, before passing away in August 1957 from a stroke.² His reputation never recovered during his lifetime. It was only in recent years that the works and contributions of Rudolf Weigl were re-examined by modern society. In 2003, he was posthumously honoured as Righteous Among the Nations by the State of Israel, for having saved countless Jews during the war.¹⁴

Ludwik Fleck

Ludwik Fleck (1896 – 1961) was a young Jewish medical student during the first world war.¹⁴ As a student, he worked under Rudolf Weigl throughout the war and was commissioned as a medical officer in the Austro-Hungarian Medical Corps with a mission to fight typhus.¹²

After the first world war, he worked in Rudolf Weigl's laboratory.⁹ Using the results he obtained in Weigl's lab, he successfully wrote and defended his doctoral dissertation and was conferred the Doctor of Medical Science title in 1922.¹³ During his time in the lab,

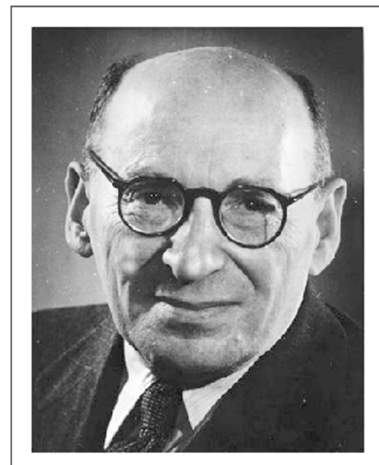


Figure 5 - Professor Ludwik Fleck

he worked on typhus diagnosis, using a suspension of the bacteria.¹³

The Germans invaded Lviv in 1939 and executed countless Polish scientists.¹³ Fleck and his wife were spared as Weigl brought him in under his lab.¹³ He was soon transferred to a Jewish ghetto laboratory. During this time there, he discovered that the urine of typhus patients contained pieces of proteins that had protective functions against the bacteria.¹³ This coined the idea in Fleck to produce a vaccine based on human urine, which differed from Weigl's vaccine containing grounded up lice entrails. However, to the Nazis, the idea of using the urine of infected "racially impure sub-humans" to treat their population was thrown out of the door immediately.¹³ Fleck, together with other doctors and scientists, eventually turned to infected rabbit lungs to grow vaccine materials.¹⁵ However, as rabbits are normally not susceptible to typhus, it is nearly impossible to grow enough material to make a vaccine.¹¹

Soon after, the Nazis were so desperate for a typhus vaccine that they gave no second thought to the words of Fleck. When he brought up his rabbit vaccine ideas to his German superior, who has close to zero knowledge of vaccines, he said nothing in rebuttal.¹⁵ This floated another idea in Fleck's mind, an idea of extreme ingenuity. He could pass off fake vaccines as the real deal, and hand them over to the Nazis without being discovered since he was calling the shots when it comes to typhus vaccine production. When the Nazis inspected the rabbit vaccines under the microscope, they thought they were seeing typhus antigens.¹⁶ In reality, they were seeing rabbit blood cells.¹¹

Those useless vaccines were used to deceive the Nazi bosses and were sent to the front lines. The German soldiers who were inoculated with them never returned. Here, Fleck is in-charge of two vaccines – the real ones from human pee and the fake rabbit vaccines. The real vaccines were circulated around Fleck's team, and subsequently around the ghettos, saving countless Poles and Jews in the process.¹⁶ The Nazis never discovered the lie and the capitulation of the Third Reich occurred in May 1945, bringing an end to the horrors of the war in Europe.

Fleck had a glamorous career after the war. He returned to Poland and became head of Lublin's Skłodowska-Curie University Microbiology Institute.¹⁶ He was subsequently elected as a member of the Polish Academy of Sciences.¹⁶ Throughout his remaining life, he published dozens of papers and continued to contribute to the fields of bacteriology, serology and immunology.¹⁷ His fate was the opposite of Weigl's. One possible explanation was that Fleck was never seen as directly collaborating with the Nazis to develop vaccines. He was seen to be captured by the Nazis and was developing vaccines as a prisoner of war. Fleck died in 1961 of a heart attack.

Aftermath

After the war, many Nazi personnel were tried for their roles in the war, many of them committed suicide, to default on answering for their actions. The rest were sentenced to death by the Allied military tribunal for their involvement in war crimes and the Holocaust. *SS-Obergruppenführer* Reinhard Heydrich, the mastermind behind the usage of typhus on Jews, was assassinated in 1942 by Czech armed resistance fighters.¹⁷ One of the many instances where we see karma playing out. Many German medical professionals, some with SS affiliation, were indicted during the Doctors' Trial. 13 personnel were found guilty of illegal human experimentation related to typhus and were hanged. They were among the hundreds who would pay for their crimes with their lives. Today, typhus is no longer a threat as there are ample antibiotics and vaccines that could treat infections effectively.

Reflections

In any conduct of war, the golden rule is to minimise casualties, be it military or civilian. While death is unavoidable on the frontlines due to gunfire and other weaponry, what about the actions of Fleck? Was it ethical? While Fleck deserved credit for his role in saving the lives of innocent Jews and Poles, what about the Nazi soldiers who were fighting on the frontlines? While many of them were indoctrinated by Nazi ideology and were willing to fight to their deaths, there certainly were pockets of conscripted soldiers who were sent to the battlefield against their will. Due to prevailing Nazi state policies at that time which mandated compulsory conscription for these young adults, it meant either serving in the Armed Forces or face persecution. By inoculating them with fake vaccines and giving them a false sense of security to fight, is there justice for those innocent soldiers? Personally, this is a tough nut to crack. On one hand, these soldiers were not willing parties in the war. Hence there is no strong reason to kill them. They were forced to fight. On the other hand, had Fleck not done what he did, there would be more casualties from both the Nazis and the Allies. It can be argued, to some extent, that the death of those small pockets of soldiers was a necessary sacrifice, to prevent even more bloodshed.

I feel injustice for Weigl. While Fleck gained fame and wealth, Weigl was denounced as a traitor and had to live the rest of his life low. Ironically, had Weigl not saved Fleck, the latter would have been shot. While Weigl has probably done no wrong, the post-war societal construct by the Soviet-controlled Polish government had sealed Weigl's fate. In many instances, an occupying force would denounce any persons linked to the enemy. Weigl was unfortunately caught in this and was ingrained in society as a traitor. It seems that Fleck, who has German blood on his hands, has done more right

and deserved more good karma than Weigl. This contradicts our morals. How could someone who killed people, be it out of necessity or not, be deserving of more good things and karma, than someone who achieved the same purpose while not killing anyone?

Another intriguing item was how this episode could have shaped the course of world history. Had the scientists not done what they did, the Nazis could have won the Soviet Union in the fight and conquered both Europe and Eurasia. Who knows, we could be speaking German today and this piece could have been typed in German. That was perhaps why scientists are held in high regard when it comes to war. Albert Einstein famously sparked the development of the atomic bomb while fleeing the Nazis. Had the Nazis incentivised him, the atomic bomb trump card could be held by Hitler, and he could have had the ability to nuke the world several times over. Had the Nazis killed Weigl and Fleck, the typhus bacteria itself could also have altered the world by infecting and killing millions. It goes to show how fragile our path as species on this Earth is and all the more we should preserve and protect the peace and stability that we have. For all we know we could be wiped out by a single bacteria naked to the human eye. Many microbes have caused tremendous changes to the world and typhus would not be the last. What we can do is not only to hope for the best for humanity, but to also institute actions to prevent, as far as possible, the eradication of mankind by something so small. Nobody truly wins a war. In the course of the above events, the Allied forces lost several million men and the German state was on the brink of collapse. Weigl and Fleck were scientists caught in the crossfire of war. Given their knowledge and advanced studies in the field of microbiology and bacteriology, it was easy for them to market themselves as high-value targets to their captors by offering to work for them. Yet, conscience prevailed and both of them remained loyal to their causes, even going on to take the risk of sabotaging their captors. Had their lie been exposed, it would certainly mean the immediate death penalty for them, and perhaps the execution of everyone remotely involved with the names "Rudolf Weigl" and "Ludwig Fleck". That did not happen. Perhaps it was karma, the Nazi regime's karma, that ultimately set Weigl and Fleck on the path to destroy the Nazi war machinery from the inside out.

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