

## Rudolf Weigl, typhus vaccine discoverer



Museum Narodowe Ziemi Przemyskiej

**Rudolf Weigl (1883–1957) – Polish biologist, parasitologist, zoologist, and world-famous developer of a vaccine against epidemic typhus with his son in the Botanical Garden in Lwów (Lviv)**

## A Polish “Schindler”

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Rudolf Stefan Weigl came from an Austrian family, but became a Pole by choice. He graduated from the natural sciences faculty at Jan Kazimierz University in Lwów in 1907, and earned his doctor of science degree (*habilitacja*) there in 1913. In the 20s and 30s he devoted himself to working on epidemic typhus, which had killed millions of people over the centuries. He knew how to put his discoveries to practical use: he invented the first effective vaccination against typhus, which he applied in China and Abyssinia even prior to WWII. He then gained world fame and membership in many scientific institutions, was repeatedly nominated for the Nobel Prize, and his typhus research institute became a mecca for many scientists eager to learn about his research methods.

Weigl’s achievements were best summed up by Charles Nicole, director of the Pasteur Institute, who had received a Nobel Prize for discovering that epidemic typhus was in

fact carried by lice: “Weigl discovered a magnificent vaccine against epidemic typhus (...) thanks to which he saved thousands of people’s lives. He is a man deserving of the greatest esteem as an exceptional mind, an indefatigable worker, and a fanatic of science.”

### Pioneering research

Epidemic typhus is caused by a bacteria of the species *Rickettsia prowazeki*. These bacteria develop in the alimentary canal of the human body louse. The chief obstacle to developing a vaccine was the insect’s tiny size. Weigl discovered a method for performing the artificial intrarectal infection of lice, and thus managed to cultivate the bacteria. Using micro-infection and micro-preparation techniques that he himself developed, he succeeded in isolating a vaccine.

Producing the vaccine required a complex procedure. The first stage involved feeding the lice. Healthy insects were placed within special cages, covered on one side with gauze. These cages were next “docked” to the thigh

of a human volunteer with an elastic band; generally some 7-11 such cages were applied. The lice would thus suck blood for some 45 minutes, once a day for 12 days. Later, institute staff infected the insects with typhus bacteria in order to produce the vaccine.

### “Weigl’s list”

The Soviets entered Lwów in 1939, and after two years of Soviet occupation the town was taken by the Germans. They began to murder Polish scientists. During the night of 3-4 July 1941, they shot 32 professors and more than a dozen of their family members in the Wulka Hills. The victims included Tadeusz Boy-Żeleński, an eminent writer, Antoni Łomnicki, a mathematician and a professor of Lwów Polytechnic University, and Tadeusz Ostrowski, dean of the Medical Department. The Germans closed down all the learning institutions in Lwów, aside from the polytechnic university.

In an effort to help salvage the Lwów scientific community, Weigl made the difficult decision of agreeing to run the Institute and produce vaccines for the Germans. He saw this as an opportunity to aid the throngs of unemployed professors and assistants from the city’s education institutions. However, he demanded that the Germans give him complete freedom in choosing his personnel and recruiting the lice feeders necessary to produce the vaccine. All the staff members received special identity papers, or *Ausweis*, with a black band that protected them from arrests, round-ups, or deportation to concentration camps.

The Institute’s lice feeders were chiefly representatives of the Lwów elite: researchers, artists, and the intelligentsia. Among them were Stefan Banach, the founder of a famous school of mathematics, other members of the school Jerzy Albrycht and Władysław Orlicz, as well as the bacteriologist and science historian Ludwik Fleck and the psychologist Mieczysław Kreutz. The staff members also included officers in the Home Army (AK) resistance movement. The list of those Weigl saved would be just as long as “Schindler’s list”.

### A Polish conscience

In view of Weigl’s scientific breakthroughs and especially the value of his vaccine, which was administered to some 8 million people during the war, the occupants proposed that he accept German citizenship, so-called *Reichsdeutsche*, and become the director of an institute to be set up for him in Berlin. Weigl turned this proposal down categorically. He preferred to die than to take an offer that would have disgraced him as a Polish professor.

Weigl not only worked to produce his vaccine, he also actively contributed to the fight against the occupying force. He worked together with the underground authorities of the Home Army in the Lwów district, supplying partisans with typhus vaccine. He sent many shipments

of the vaccine to the Warsaw Ghetto, to ghettos in other Polish cities, and to the concentration camps in Majdanek and Auschwitz. Also involved in the delivery of this reliable vaccine was the famous bacteriologist and immunologist Ludwik Hirszfeld, who later described this dangerous operation in his memoirs.

Once the war against the Germans was won, Lwów became incorporated into the Soviet Union and Weigl had to leave his city. He became a man without home. He tried to continue his work first at Jagiellonian University in Kraków, then later at Poznań University.

He did not have an easy life, and was not respected by the Communist authorities of postwar Poland. In 1946 the Polish Government withdrew his candidacy for a certain Nobel Prize. The hardest thing for him to accept was the fact that some of his former associates accused him of having collaborated with the Germans, allegations that were absurd in view of what he had done during the occupation.

Rudolf Weigl was posthumously awarded the “Righteous Among Nations” medal. Polish poet and Nobel laureate Wisława Szymborska wrote in one of her poems – “to believe in man: good and strong, but good and strong are still two different people.” Rudolf Weigl, as both a scholar and an independence fighter, knew how to combine both these two traits. ■

**A reading room at Jan Kazimierz University in Lwów (now Lviv), where Rudolf Weigl studied the natural and medical sciences, and where he became professor in the 1920s**



Stanisław Kosiński