

Thomas Hager: *The Demon under the Microscope*

The Third Man

Until the 1930s, a trivial bacterial infection meant mortal danger.

A German physician produced hope for mankind.

Since its institution 106 years ago, the Nobel Prize in Physiology or Medicine has been awarded three times to men who discovered antibiotics. Ranking first, penicillin-hero Alexander Fleming is possibly the most famous due to winning the prestigious prize in 1945. The Ukrainian-American microbiologist Selman Waksman, is known only by experts for his decade-long work that led to the discovery of streptomycin, the first effective treatment for tuberculosis. The third man to mention at this point is – Gerhard Domagk.

Gerhard – who?

Thomas Hager's thrilling book *The Demon Under the Microscope* gives the answer. It is subtitled: *From Battlefield Hospitals to Nazi Labs, One Doctor's Heroic Search for the World's First Miracle Drug*. This description sounds pretty lurid. Can Hager, a freelance medical writer from Eugene, Oregon, the repeated biographer of genius Linus Pauling, keep his promises?

He can. Hager's book about the development of sulphonamides or 'Sulfa drugs' in the 1930s is a page-turner, if ever there was one. Start reading at any page and you will be instantly captured. Sulfa drugs were the first ever broad-spectrum antibiotics used to treat fungal pneumonia, shigellosis, and certain protozoan infections. Sulfa medication was a quantum leap for modern medicine.

The book, however, is not about Domagk and sulphonamides alone. It is a colourful depiction of the emerging medical knowledge in the last decades of the 19th century, of its heroes such as Koch, Lister, and Semmelweis – and of their limitations.

In 1931, humans could fly across oceans and communicate instantaneously around the world. They studied quantum physics, [...] suffered mass advertising, got struck in traffic jams, [...] and worried about their weight. In Western nations people [...] were, in most senses, thoroughly modern. But in at least one important way, they had advanced little more than prehistoric humans: They were almost helpless in the face of bacterial infection.

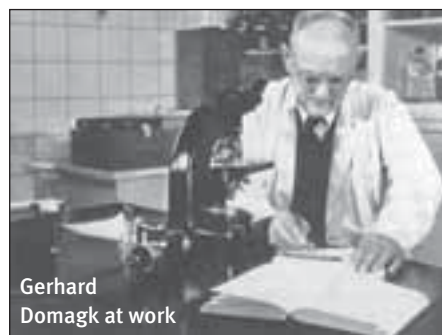
In part one of his book (*'The Hunt'*), Hager describes how Gerhard Domagk lit-

erally looked at the blood when the 18-year-old student entered World War I in 1914, fighting as a Leibgrenadier for the German Emperor Wilhelm II. Soon Domagk was wounded, and afterwards he became a military surgeon by means of a crash course. At the front line Domagk saw ...

...wounds no one had ever seen before, thanks to the advance of military and industrial science. Unprecedentedly powerful [...] weapons were slaughtering men at a rate and in ways unimaginable [...] earlier.

Looking at the blood

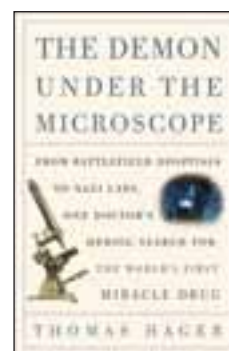
In addition, young Domagk encountered the worst sickness of all, the horrible gas gangrene – *Gasbrand*, as it is called in German. This furiously contagious infection is caused by *Clostridium* bacteria, which eat away and eventually rot the muscle tissue, releasing toxins and gas that poison the pa-



Gerhard Domagk at work

tient and balloon his wounds, respectively. *Once the gas gangrene was under way, the bacteria almost always won.* Doctors' weapons were blunt at that time, even perilous. In fact, it was healthier to do nothing.

In 1918, when the war was over, Domagk was twenty-four – a young, motivated physician, determined to counter these terrible enemies that murder maliciously and treacherously. Poor as a church mouse, he became professor in the Baltic city of Greifswald. His boss was content with him, but not so however, the university's janitor: *Domagk was working too late, using too much electricity*, he complained. That came to an end when Domagk entered the IG Farben in 1927, which was the most powerful chemical company in the world at that time (and,



in addition, producer of poisonous gases and subsequently a Nazi collaborator). They put strong emphasis on developing new – and lucrative – synthetic drugs. At their new drug research institute near Wuppertal, the ambitious Domagk seemed to be the right man in the right place.

After a little while he proved his mettle and struck pharmaceutical gold when he discovered in 1932 that a red dye protected mice against lethal doses of staphylococci and haemolytic streptococci. Domagk had discovered the first effective sulphanilamide. Later it was called *Prontosil*. It would save the lives of millions and earn Domagk the Nobel Prize a few years later.

Humorous and haunting

In part two of Hager's book (*The Right Side*), he describes the confusing patent trials surrounding *Prontosil* as well as the multiple benefits of this new class of drugs – whereas in part three, he highlights the '*Left Side*' of sulfa: people went hysterical on the 'modern miracle', countless new (often ineffective) sulfa preparations flooded the market, and dilettante companies brewed perilous knock-offs that took hundreds of lives. He also narrates the sad story of Nazi Germany prohibiting Domagk from receiving the prize and throwing him into prison.

In addition to the main Sulfa saga, Hager has inserted informative background chapters. One focuses on the formation of the dubious IG Farben. Another, tells the story of Paul Ehrlich's 'magic bullet' against syphilis, namely Salvarsan, which was the first modern chemotherapeutic agent. A further exceptionally haunting chapter, filled with anecdotes, details a physician with the appearance of 'Edward G. Robinson in a lab coat' namely Wilhelm Roehl, who found a 'biblical healing' for sleeping sickness (after he had tested it on innocent natives).

In a word: a page-turner. One highly anticipates more from this author.

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