

MIND TO MIND

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Stephen T. Harvey, M.D., Editor

Necessary Heroes and Ethos, from Fighting Nazis to COVID-19

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Healthcare workers on the front lines today face the danger of contracting COVID-19 while treating infected patients, and possibly even dying of this deadly disease. In fact, as of July 2020, over 3,000 healthcare workers have died of COVID-19 worldwide.¹ This sad state of affairs is likely due to the stunning virulence of the SARS-CoV-2 virus, and the shocking lack of foresight and stewardship that have left many healthcare workers without sufficient personal protective equipment such as N95 respirator masks. Yet this is neither the first nor likely the last time that doctors, nurses, and others will risk their own lives to save the lives of patients. This timeless theme of clinician self-sacrifice is exemplified by the actions of two Polish doctors who risked their lives almost 80 yr ago to save over 8,000 people from Nazi concentration and forced labor camps. Their story bears retelling now in the COVID-19 era, both for its theme of physician self-sacrifice and for its message about the importance of understanding the imperfections of laboratory testing.

Drs. Eugene Lazowski and Stasiek Matulewicz were practicing in Rozwadów and Zbydniów, respectively, two small Polish villages under Nazi occupation during World War II. At that time, the Nazis would frequently round up suspected members of the Polish opposition and send them to provide forced labor in munitions factories, mines, quarries, chemical plants, or other industries. The work was grueling and conditions were horrific. Many did not survive due to malnutrition and diseases such as tuberculosis, typhus, typhoid, or other infections.

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Accepted for publication July 1, 2020. Published online first on July 15, 2020.

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The Nazi Wehrmacht (armed forces) were terrified of typhus, a rickettsial disease endemic in Poland at that time, because typhus epidemics could decimate an army's fighting strength. Although typhus presented clinically with purple rash, headache, fever, and delirium, it was diagnosed serologically at that time using the Weil–Felix test,² which was performed by mixing a patient's blood sample with *Proteus* bacteria. If the mixture clumped when heated, the patient had typhus. In a small makeshift laboratory behind his house, Dr. Matulewicz discovered that the Weil–Felix test would yield a false positive for typhus if a patient had first been injected with dead *Proteus* bacteria.³

Since Drs. Lazowski and Matulewicz knew that documentation of typhus was sufficient to prevent the Nazis from deporting Polish citizens to forced labor camps in Germany, they created a mock epidemic of typhus by immunizing people with the killed *Proteus* strain OX19. To make the epidemic look authentic, they immunized more people in the winter than in the summer, so that reports to the authorities followed the natural epidemiologic pattern of typhus. This went on for nearly 2 yr of the war. Consequently, over 8,000 Polish citizens were spared from deportation to forced labor and concentration camps, likely saving thousands of lives.

Interestingly, at one point Drs. Lazowski and Matulewicz were betrayed by Nazi collaborators, who reported that they saw no ill people in the village. The Nazis sent a team of doctors to investigate, but the Polish resistance alerted Dr. Lazowski, who hastily arranged a group of peasants to act bed-ridden and pretend to have fevers and chills. When the Nazi inspection team arrived, their doctors were so terrified of louse infestations that they did not even examine these patients. The Nazi inspectors simply peeked into the room to make sure someone was in the bed and quickly drew blood samples before leaving. These blood samples were then sent to a reference lab in Germany, because the Nazis suspected subterfuge by Drs. Lazowski and Matulewicz. Of course, the test results were “positive,” reflecting a biologic false positive from *Proteus* immunization. Thus, the ruse went undiscovered, likely sparing Drs. Lazowski and Matulewicz and their families from being sent to concentration camps or being summarily shot.

During World War II, these two doctors cleverly manipulated a laboratory test to create false positives in order to save lives. Today, there is concern about the exact converse. False negative nasopharyngeal polymerase chain reaction tests for SARS-CoV-2 may occur in roughly 30% of infected patients^{4,5} and could lead to the erroneous conclusion that patient isolation and appropriate personal protective equipment are not necessary,^{6,7} potentially causing iatrogenic spread of SARS-CoV-2 (which happened

in the 2003 SARS outbreak in Toronto⁸). Just as an imperfection of laboratory testing (*i.e.*, false positives) saved lives during World War II, today in the COVID-19 era, we should be cognizant of another imperfection of laboratory testing (*i.e.*, false negatives) that could take lives. Further, as serologic testing for antibodies against SARS-CoV-2 is promoted as a basis to reopen our shuttered economy, based on the untested hypothesis that the presence of anti-SARS-CoV-2 IgG confers lasting immunity, understanding the limitations of laboratory tests has even more widespread public health implications.

After World War II, Dr. Lazowski moved to Chicago, where he became a professor of pediatrics at the University of Illinois, and Dr. Matulewicz moved to Zaire, where he became a radiologist at the University of Kinshasa. They were fortunate to survive the Nazi occupation of Poland, though perhaps their most remarkable legacy was saving the lives of over 8,000 of their fellow citizens and patients through their ingenuity and bravery. So too will most (though not all) healthcare workers survive the COVID-19 pandemic. Just as thousands of patients were saved from the Nazis by the risks taken by Drs. Lazowski and Matulewicz, today thousands—if not millions—of patients will be saved from COVID-19 by the risks taken by doctors, nurses, and other healthcare workers. Yet perhaps the most important legacy of our front-line healthcare colleagues who have fallen and those of us who continue to battle the COVID-19 pandemic will be a reminder to current and future generations of this timeless ethos, that healthcare workers will risk personal danger to save the lives of our most vulnerable patients.

Acknowledgments

The authors thank the virologist Dr. Donald Ganem (Professor Emeritus, University of California, San Francisco, School of Medicine, San Francisco, California) for telling the story of Drs. Eugene Lazowski and Stasiak Matulewicz in a University of California, San Francisco, medical school microbiology lecture in 2003. This essay is dedicated to the memory of all the clinicians worldwide who have fallen in the fight against COVID-19.

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