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One Hundred Years of Chemical Warfare: Research, Deployment, Consequences

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Foreword

This book is a collection of the contributions to the symposium organized at the Fritz Haber Institute in commemoration of the 100th anniversary of the gas attack at Ypres during the First World War. A centennial is normally a celebratory event, but certainly not so in this case: The centennial of the first large-scale gas attack in Ypres is an event that we commemorate as a dark hour in human history, an event where I as a chemist—as many chemists—feel ashamed, and it is also an event that gives us reason to consider the responsibility of scientists for their actions—or the lack thereof. If one reads the reports, even now, one hundred years later, one can only feel deeply affected by the suffering inflicted on the gas-attack victims and on their families.

The First World War—like almost any war—was a time during which numerous atrocities were committed in the name of patriotism. The use of gas to kill and incapacitate soldiers was one of the worst of these atrocities, and it made use of the science and technology developed by the chemical industry, which at that time flourished and prospered, especially in Germany. Science and technology have been used time and again in human history in order to improve weapons technology, but the chemical warfare in the First World War was arguably the first time at which the precision of the modern scientific methods was employed for making war more efficient and deadly, an approach that culminated about 30 years later in the Manhattan Project. Our view of events and actions changes with time, and what seemed right at the time it was done may appear utterly wrong when judged later from a distance. However, chemical warfare was not judged unequivocally as being right even during the First World War, and it was internationally banned by the Geneva Convention in 1925.

These introductory words I write in two different roles: first as a chemist, as a professional fellow of those who developed and deployed this cruel weapon, or, maybe more accurately, means of indiscriminate mass killing. I feel responsible for preventing anything like it from happening again. As a chemist, I hope that the brilliant minds in our science will turn toward research that will help mankind and not toward research to kill fellow humans. We have to teach this lesson to the

younger generation, and I am convinced that the vast majority of chemists today feel the same.

At the venue of the symposium, the Harnack House, a stone's throw from the Fritz Haber Institute, it was not possible to discuss the chemical attack at Ypres without talking about Fritz Haber. Thus, I am writing these words also as vice president of the Max Planck Society, the successor of the Kaiser Wilhelm Society, which was the scientific home of Fritz Haber, one of the most prominent proponents of gas warfare. We are also the organization to which an institute bearing Fritz Haber's name belongs.

The institute was named after its founder in 1952—as an act of redress after the injustice committed by the Nazi regime against Fritz Haber. But as the plaque at the institute's building says, “the name of the institution is equally reminiscent of bright and dark sides of an eminent researcher in German history and is therefore a piece of living memory which should not be abandoned. The name is not solely intended as a tribute to Haber the scientist, but is a critical appreciation of an exemplary life in his time, which gives an impetus for reflection, for a differentiating assessment, and a memento for our own time.”

This very institute was one of the organizers of this symposium, together with the Max Planck Institute for the History of Science, which clearly shows that we are also well aware of the dark sides in the life of its name-giver, and that we take responsibility by calling attention to these dark sides.

Most human beings and their deeds in the world are neither black nor white; they exhibit different shades of gray, possibly at different times in their lives. Fritz Haber was such a Janus-faced man. He developed the ammonia synthesis, a process without which the world would not be able to sustain the population of today; a process which is needed to feed the world. His publication on the ammonia synthesis, together with Robert le Rossignol, in 1913, is one of the true landmarks of science. I recommend it to each and every of my students as a masterpiece from the history of science. It is a single paper which nowadays would carry many scientists through their whole careers. It clarified the thermodynamics, described the innovative recycling concept, the high pressure technology needed, several classes of catalysts, and the kinetics of the process observed with these catalysts. On the other hand, this scientific hero turned his attention less than two years later to chemical warfare, like many other of his fellow chemists and physicists. With the same scientific approach, the same precision he had used in the research on the ammonia process, he developed the basics for the deployment of chlorine as an agent for chemical warfare. The same brilliant mind was then pursuing a goal that is nowadays clearly rejected as an aberration of science; the precision in the investigation of the most efficient ways of killing other human beings makes me shudder today.

However, while this view is probably unanimously shared today, it was not fully prevalent at the time, which is in the focus of this symposium. Scientists in the belligerent countries were working on gas warfare, and the question of whether this was ethically, morally, and legally permitted was highly disputed. Humankind progresses, hopefully, and we should take the lessons learned in order to turn the

power of science toward the betterment of the human condition. Ypres stands as an admonition of where science can lead humans. Fortunately, most scientists involved in this effort during the First World War worked on weapons research only for a limited time. Except for this dark time, they made many discoveries that helped to lay the foundations of the technology our societies rely on today. The latter discoveries are the aspects of science that we should foster and highlight as exemplary for the younger generation, so that we never revert to the kind of research performed in the dark years of World War I.

The two Max Planck Institutes that organized this commemorative event and edited this book did it in the way that is appropriate for the Max Planck Society: in the form of a scientific symposium and a scientific publication, in order to elucidate the various aspects of chemical warfare introduced at the beginning of the last century: “Research, Deployment, Consequences,” as the subtitle of the symposium reads. May this book bring new insights for its readers, but more importantly, may it serve as a remembrance of the many victims of chemical warfare, and may it remind us to never let science be corrupted in this manner again.

Ferdi Schüth
Vice President of the Max Planck Society