



# Rocky Mountain AIChE News

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## **April Section Meeting: Fritz Haber: A Great but Flawed Genius of Chemistry and History**

German chemist Fritz Haber (1868-1934) earned his doctorate in 1891 in organic chemistry. In 1893 he converted from Judaism to Christianity. In 1894 he began an academic career, switching to physical chemistry and electrochemistry. In 1901 Haber married Clara Immerwahr, also a chemist with a doctorate. In 1910 he achieved his first great success: the synthesis of ammonia from its elements, an invention that has saved millions from starvation and death by providing unlimited quantities of nitrogen fertilizer. In 1911 Haber was appointed director of the Kaiser Wilhelm Institute for Physical Chemistry and Electrochemistry in Berlin. During World War I Haber's ammonia became indispensable to Germany's war effort since it can be converted to conventional explosives. During the war Haber led the development of chemical weapons gas. Approximately 90,000 were killed by the poison gas in WWI and 1.2 million were injured. Many scientists participated in chemical-weapons work, e.g., chemists W. Nernst (Nobel 1920), O. Hahn (Nobel 1944), V. Grignard (Nobel 1912), W.J. Pope, G.N. Lewis, etc. But some refused to participate, e.g., H. Staudinger (Nobel 1953) and E. Rutherford (Nobel 1908). Haber's wife Clara, bitterly opposed to his poison-gas work, committed suicide shortly after the first poison-gas attack

WWI Haber engaged in (illegal) chemical weapons development and developed pesticides, including Zyklon B, later used to murder around 1.2 million victims in the Nazi concentration camps of the Holocaust. In 1933 Haber left Germany and died in 1934. He was a brilliant chemist but lacked ethics and morality and was blind to the realities of the society around him. His life raises complex questions of morality in science.



Joseph Gal, PhD, is Professor Emeritus retired from the University of Colorado School of Medicine (SOM). Joe completed his high-school education in Budapest, Hungary, and graduated with a B.Sc. in chemistry from the American University of Cairo, Egypt. He earned a PhD in organic chemistry at UCD that is, the University of California, Davis. In 1977 Joe began his career at CU SOM as an Assistant Professor. Joe's career at the CU SOM included teaching, research, and directorship of the toxicology section of University of Colorado Hospital's clinical laboratories. His research activities focused on the fate of drugs in the body. About 15 years ago Joe changed his scholarly interests and has been focusing since then on the history of science. He has been

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