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Fritz Haber and the Double-edged Sword of Synthetic Nitrogen II

Lead: In the early 20th century German chemist Fritz Haber developed the process leading to the creation of synthetic nitrogen. His brilliant innovation, however, is very much a double-edged sword.

Intro.: *A Moment in Time* with Dan Roberts.

Content: After his initial breakthrough for which he received the Nobel Prize for Chemistry in 1918, Haber was made the director of the Kaiser Wilhelm Institute for

Physical Chemistry in Berlin. With the outbreak of World War I, he led in the development of poison gas. His motives appear to be mixed, partly emerging out of intense German patriotism, but also in hopes that the use of gas would hasten the end of the bloodletting. He returned home greatly disappointed in the war's result, but also conflicted over his own role in the use of chemical weapons. Haber's wife committed suicide shortly thereafter, it is said partly in revulsion over her husband's complicity in the wartime carnage. After the Nazi takeover in 1933, as an ethnic Jew, he saw that even his long-time loyal service to Germany would not protect him against the coming barbarity and

accepted a post in Cambridge, England. He died in obscurity in 1934.

Haber's greatest contribution was in creating synthetic nitrogen which has transformed agriculture and made it possible to support a much larger world population. The good news is perhaps two billion people are alive today because of synthetic nitrogen fertilizer. The bad news is that two billion are alive today dependent upon synthetic nitrogen fertilizer. In addition, because of the nitrogen cycle, this huge increase, some estimate the annual amount at 175 million tons into world cropland, either goes back into the atmosphere, eats away at the ozone layer thus

contributing to global warming, or, in the form of runoff, enters the water supply, forcing out other valuable nutrients such as oxygen and causing the overgrowth of algae thus killing off competitive plant and animal marine life.

Finally, there is evidence that the availability of cheap, abundant synthetic nitrogen, a key ingredient in the production of conventional munitions, figured in German strategic calculations prior to that nation's initiation of World Wars I and II. Haber's brilliant contribution cannot be denied and the results have been very positive, but also decidedly negative.

At the University of Richmond, this is Dan Roberts.

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