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Nota di contenuto	Intro -- Preface by Gerhard Ertl -- Preface -- Acknowledgments -- Contents -- Part I A Confluence of Factors -- 1 The Object of Investigation -- 2 The Scientification of Agriculture -- 3 Advances in Organic Chemistry, Catalysis, and the Chemical Industry -- 4 The Mystery of Ammonia Synthesis -- 5 Physical Chemistry: Uniting Two Branches of Science -- 6 The Scientific Breakthrough (1903-1908) -- 7 The Challenge of Technical Implementation -- 8 Reflections on Scientific Discovery and The Haze -- Part II The Scientific Breakthrough -- 9 The State of Ammonia Synthesis at the Turn of the Twentieth Century: The Arena for Discovery -- 10 Fritz Haber's Work and Thought as He Began Work on Ammonia Synthesis -- 11 The Scientific Publications on Ammonia Synthesis -- 11.1 Über die Bildung von Ammoniak aus den Elementen (On the Generation of Ammonia from the Elements) by Fritz Haber and Gabriel van Oordt, 1905 -- 11.1.1 Über die Berechnung chemischer Gleichgewichte aus thermischen Messungen (On the Calculation of Chemical Equilibrium from Thermal Measurements) by Walther Nernst, 1906 -- 11.1.2 Über das Ammoniak-Gleichgewicht (On Ammonia Equilibrium) by Fritz Haber and Robert Le Rossignol, 1907 -- 11.1.3 Über das Ammoniakgleichgewicht (On Ammonia Equilibrium) by Walther Nernst with Experiments from Friedrich Jost, 1907 -- 11.1.4 14th Meeting of the Bunsen Society, Hamburg, 1907 -- 11.1.5 Über das Ammoniakgleichgewicht (On Ammonia Equilibrium) by Friedrich Jost, 1908 -- 11.1.6 Bestimmung

des Ammoniakgleichgewichts unter Druck (Determination of Ammonia Equilibrium Under Pressure) by Fritz Haber and Robert Le Rossignol, 1908 -- 12 Haber's Cooperation with BASF -- 13 The Role of Physical Chemistry as a Theory -- 14 Further Reflections on Scientific Discovery and The Haze -- Part III The Haze: A Theory for Breakthroughs in Science -- 15 Terminology. 16 Normal Science -- 17 The Structure of The Haze -- 18 Dynamic of The Haze -- 19 Between Science and Industry: The Stage of 10-100 -- 20 Risk and the Acceptance of Failure -- 21 The Haze: Interdependencies in Science -- 22 One Final Element -- A Approximations of Free Energy Fitting Functions -- B Theoretical Determinations of the Free Energy: Hermann von Helmholtz and Walther Nernst -- References -- Subject Index -- Places and People.

Sommario/riassunto

This Open Access book discusses the progress of science and the transfer of scientific knowledge to technological application. It also identifies the factors necessary to achieve this progress. Based on a case study of the physical chemist Fritz Haber's discovery of ammonia synthesis between 1903 and 1909, the book places Haber's work in historical and scientific (physicochemical) context. The scientific developments of the preceding century are framed in a way that emphasizes the confluence of knowledge needed for Haber's success. Against this background, Haber's work is presented in detail along with the indispensable contributions of his colleague, the physical chemist, Walter Nernst, and their assistants. The detailed accounts of scientific advancement remind us of the physical basis on which our scientific theories and ideas are built. Without this reminder we often forget how complex, and how beautiful achievements in science can be.
