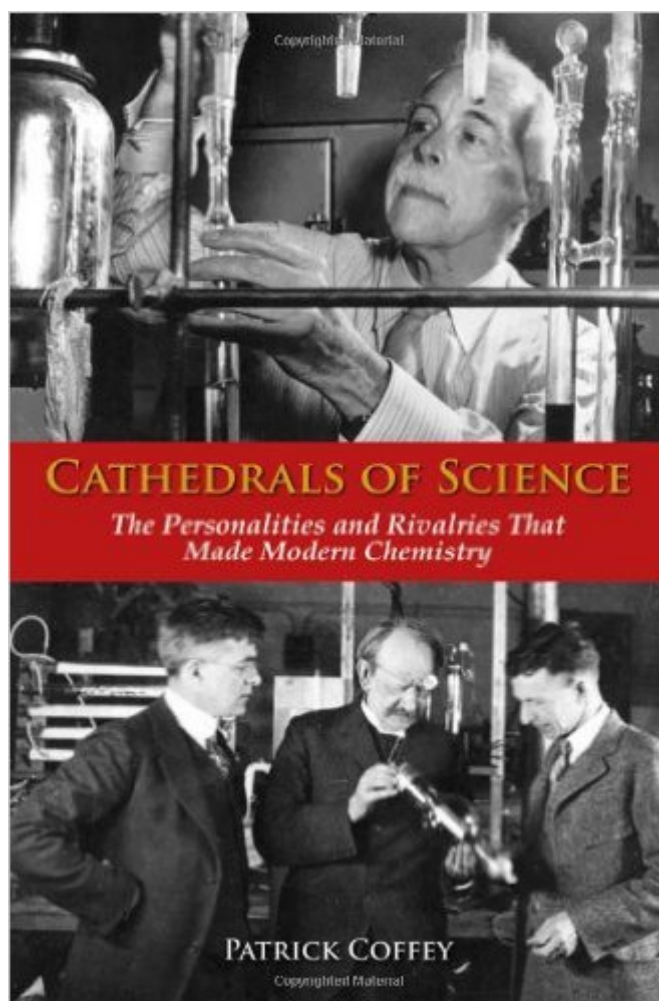


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# Cathedrals Of Science: The Personalities And Rivalries That Made Modern Chemistry



## Synopsis

In *Cathedrals of Science*, Patrick Coffey describes how chemistry got its modern footing-how thirteen brilliant men and one woman struggled with the laws of the universe and with each other. They wanted to discover how the world worked, but they also wanted credit for making those discoveries, and their personalities often affected how that credit was assigned. Gilbert Lewis, for example, could be reclusive and resentful, and his enmity with Walther Nernst may have cost him the Nobel Prize; Irving Langmuir, gregarious and charming, "rediscovered" Lewis's theory of the chemical bond and received much of the credit for it. Langmuir's personality smoothed his path to the Nobel Prize over Lewis. Coffey deals with moral and societal issues as well. These same scientists were the first to be seen by their countries as military assets. Fritz Haber, dubbed the "father of chemical warfare," pioneered the use of poison gas in World War I-vividly described-and Glenn Seaborg and Harold Urey were leaders in World War II's Manhattan Project; Urey and Linus Pauling worked for nuclear disarmament after the war. Science was not always fair, and many were excluded. The Nazis pushed Jewish scientists like Haber from their posts in the 1930s. Anti-Semitism was also a force in American chemistry, and few women were allowed in; Pauling, for example, used his influence to cut off the funding and block the publications of his rival, Dorothy Wrinch. *Cathedrals of Science* paints a colorful portrait of the building of modern chemistry from the late 19th to the mid-20th century.

## Book Information

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## Customer Reviews

Chemist and scholar Coffey brings to life the struggles of pioneering chemists who modernized the field. Many of these scientists met tragic ends and twists of fate, such as Fritz Haber, who developed the pesticide that would be used in Nazi gas chambers to kill his own relatives. Other scientists, like Marjorie Winch, became so attached to disproved pet theories that they sank into endless resentment. Coffey begins with some giants of European chemistry-Arrhenius, Nernst, Ostwald, van't Hoff-and proceeds through a number of their followers, including Americans Gilbert Lewis and Irving Langmuir. WWI saw Haber achieve infamy for his invention of mustard gas; soon, Langmuir was working to replicate the Germans' chemical weapon for the U.S., and Lewis was training gas officers for the frontlines. WWII also saw important chemistry advances; Lewis, his student Harold Urey, and Glen Seaborg pioneered techniques of nuclear chemistry essential to the creation of the Bomb. When told the loss of Jewish scientists would irrevocably damage German science, Hitler replied, "Then we will do without physics and chemistry for the next hundred years"; in this engrossing, often somber history, Coffey reminds us not just that science trumped by ideology is a damning proposition, but that even the most complex science starts with the efforts of mere humans. Copyright © Reed Business Information, a division of Reed Elsevier Inc. All rights reserved.

"Focusing on [Gilbert Lewis, Irving Langmuir, Walther Nernst, Fritz Haber] and other dramatic personae, their convoluted motivations and fierce dedication, Coffey narrates the story of not just how physical chemistry became a modern science, but also how it helped change the world - economically, socially, militarily, and politically. Ultimately the book's greatest strength grows out of what the author intended: a graphic depiction of the "personalities and rivalries that made modern chemistry."--ISIS>Weaving together the lives of the leaders of modern chemistry, Coffey shows how fights over priority, backstabbing, cronyism, and grudges shaped the history of chemistry just as much as the actual discoveries. It is an effective antidote to the bromide that science is the work of selfless, Spock-like automatons."--Books and Culture>Coffey aims at unveiling how different personal characteristics led to differences in scientific styles. How friendships, camaraderie, enmities and rivalries played a role in shaping developments in science, in strengthening scientific and social networks, in articulation of research groups, in the establishment of codes of conduct between senior researchers and young students, and in responding to various political contexts, often extreme as in the case of the two world wars. Definitely, it is when discussing how conflicts of personalities and controversies over scientific matters shape the real world of physical chemistry, that the author excels."--Metascience>In *Cathedrals of Science*, Patrick Coffey returns to headier

days for the field, when the work and relationship between a dozen-odd chemists - their brilliant collaborations, bitter one-upmanship, shifting loyalties and long-standing grudges - came to define modern chemistry and show how exactly scientific theories come to be attributed and accepted."--Zocalo Public Reviews"An excellent overview of the developments of physical chemistry."--Chemical Education Today"A gripping page-turning narrative that elegantly combines popular science with a serious history of science."--Chemistry World"Cathedrals of Science sets a professional standard for the further historical analysis of the evolution of physical and theoretical chemistry."--Bulletin for the History of Chemistry"Coffey has the proverbial good eye for anecdotes, which enlivens what could have been a dreary list of scholarly accusations."--Chemical and Engineering News"The center of Patrick Coffey's remarkable story is the ultimate difficult genius, an American original, G. N. Lewis. Around him, in peace and war, move the men and women who have shaped our understanding of molecules and how they react. And they are hardly at peace with each other."--Roald Hoffman, chemist, writer, and winner of the Nobel Prize in Chemistry"This superbly crafted book traces the intertwined careers of scientific Titans whose work, despite human failings, created major parts of the conceptual edifice of modern physical science. It is a grand saga, as illuminating for our era as the Canterbury Tales are for the age that erected great masonry cathedrals."--Dudley Herschbach, winner of the Nobel Prize in Chemistry"Patrick Coffey's wide-ranging account colorfully demonstrates, the pioneers of modern chemistry nurtured not just intellectual innovations but a collection of squabbles and grudges that influenced American science for a generation or more. Coffey excels at showing how chemistry developed both despite and because of personal rivalries in this complex and engaging tale."-- David Lindley, author of Uncertainty: Einstein, Heisenberg, Bohr, and the Struggle for the Soul of Science"Coffey has the experienced chemist's command of the science, the story-teller's gift for narrative, and the detective's tenacity in chasing down new evidence. Newcomers and experts alike will discover here a marvelous account of the main axes along which chemistry developed in the twentieth-century and find many new insights into both the science and the personalities of those who made it. This book is a joy to read."--John Servos, Anson D. Morse Professor of History, Amherst College and author of Physical Chemistry in America"Patrick Coffey has combined science with biography to create a sweeping history of the transformative chemical discoveries of the first half of the 20th century. It is a history alive with brilliance and infused with human frailties. A compelling account of scientific revolution, tragedies, rivalries, and inspiration." --Nancy Greenspan, author of The End of the Certain World: The Life and Science of Max Born"in this engrossing, often somber history, Coffey reminds us not just that science trumped by ideology is a damning proposition, but that even

the most complex science starts with the efforts of mere humans." --Publishers Weekly"A fascinating insight into the character of many of chemistry's most important personalities."--Nature Chemistry"Cathedrals of Science is an engaging, well-written, balanced account of 13 chemists who built modern chemistry...High recommended."--Choice Magazine

This book is great reading--I read it in about 2 sittings (and it's not short). Covers history of physical chemistry with emphasis on relationships between scientists, the World Wars, and the factors that contribute to recognition (or not) of scientific contributions. Essentially the whole discussion is of developments that will be familiar to undergraduate (even high school?) chemistry students: concepts of electrolytes, Nernst equation, acids/bases, chemical bonding, hydrogen bonds, and for pchem students fugacity and activity. Refreshingly little on nuclear chemistry. Gives enough chemical detail for a chemist to follow the discussion with good understanding. Unfortunately it doesn't cover the development of molecular orbital theory. Sources clearly cited. However, some of the clarification/expansion notes (not source notes, as far as I noticed) seem to be missing from the ebook.

I read this on the heels of Sam Keane's "The Disappearing Spoon ....". This is far more scholarly in digging out the theoretical foundations of physical chemistry, of the late 1800s and how the now easily embraced ideas of Arrhenius, Lewis, Langmuir, Nernst ... and more had to be fought for, and evolved. And while it is, with deference to Mr. Keane's phenomenal book, more scholarly, the two books go together wonderfully, and "Cathedrals of Science...." fit the bill perfectly for what I wanted to read next. I thoroughly enjoyed these stories .... these lines drawn from the past to the present, through the lives, work, anger, joy of a group of brilliant minds. Michael White, in his book *Acid Tongues and Tranquil Dreamers* wrote: "Ego is married to creativity ... ambition and aggression are wed to the drive to discover. The creative mind is possessed by angels and devils. The angels offer transcendence, they capture the inspirational moment and make diamonds from the dust; the devils look across the laboratory bench and whisper of ambition, offer challenges, and spur rivalry; each group plays its part." In large and small, Mr. Coffey brings those sentiments to life... a fascinating view of ego, mind, spirit, brains, attitude, approach, failure and growth. I am grateful for the chance to have the opportunity to fill in my own background with such terrific storyline, and research.

Coffey mixes the right amount of science and individual personalities with the complex global backdrop to frame the tremendous advances of physical science in the early 20th century. The egos

of these driven pioneers of chemistry are examined from several sources and described in an entertaining manner. Coffey completes this task taking a moral high road (he allows the peer group of the time to be judgmental). As a chemist and a history buff I thoroughly enjoyed this book.

When I finished reading this fascinating book, I found myself wondering: why have physics and physicists been the subjects of so many biographies, other nonfiction, novels, plays, and even opera - and chemistry and chemists so few? Not for lack of significance: Chemistry is Us. And not for lack of dramatic potential: as Patrick Coffey shows very skillfully, the history of modern chemistry is replete with profound moral quandaries, contentious outside personalities, and epic quarrels. I recommend *Cathedrals of Science* to everyone, even if you've forgotten your chemistry (the author stirs it in gently). This is a compelling story, with much food for thought.

Very nice book, especially upon the occasion of the 100th anniversary Lewis electron pair theory (2016). It describes the backstage some of the main theories used nowadays in Chemistry

A lot of science for the non-scientific to muddle through, but interesting to read history of so many crucial discoveries and all the behind the scenes politics & personalities.

A remarkable study of a genius, one who's greatest enemy was himself. Coffey's book is scrupulously detailed and brings to life a story of war, politics, deceit, passion and betrayal in the rarefied atmosphere of the scientific elite. It is a riveting account of the psychological, political and scientific struggles that consumed some of the greatest names in chemistry as they sought the Nobel Prize for themselves and as some conspired to deny it to Gilbert Lewis. It is also a cautionary tale. As we read of the excesses and abuses of government and society in a turbulent period of our history, we are reminded of the social and political unrest of our own time. Coffey writes with wit and wisdom and his biography of Lewis does justice to an amazing man and his extraordinary accomplishments. No background in science is required to enjoy this work, just an appreciation for thorough research and fine writing by an accomplished author.

The great scientists of the 19th and 20th centuries lived profoundly interesting lives and were subject to very human emotions and limitations. Coffey's account emphasizes a few interesting characters I was previously unfamiliar with, especially Lewis and Langmuir, and the conflicts between them. Though the book starts with Arrhenius and how his rivalries affected himself and

science, by the time the book gets to the Lewis portion the story is all but completely disconnected from what came before. The book really should be read as a collection of mostly excellent essays on important players in the development of modern chemistry. The Pauling-Wrinch section seems of significantly less importance than most of the rest of the book. As a practicing scientist, I wish some more scientific detail had been included, but the general reader might find it hard going in a few places. Overall, this is a very good book and I recommend it to anyone with an interest in the development of modern science.

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