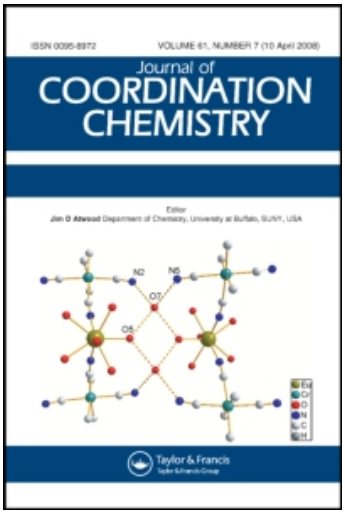

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ÉLOGE John C. Bailar, Jr. (1904-1991)

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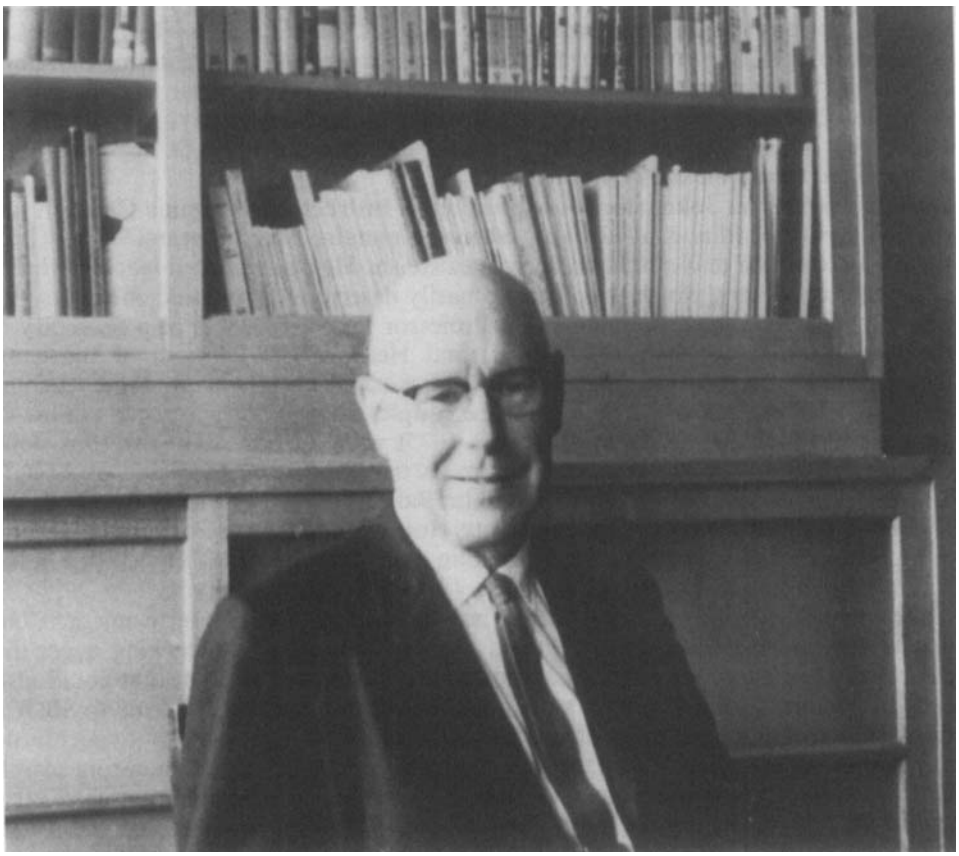


J.C. Bailar, Jr., aged 63; Japan, October, 1967.

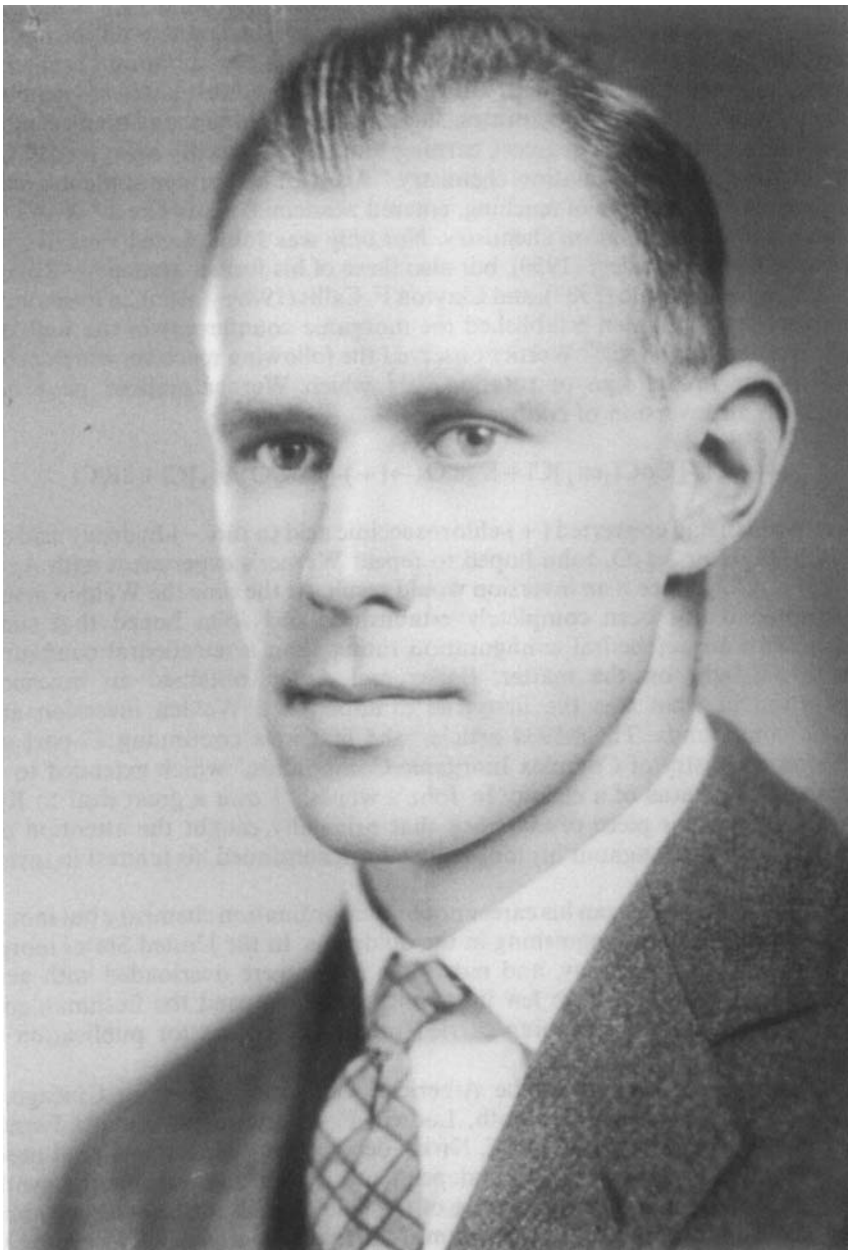
On October 17, 1991 John Christian Bailar, Jr., Professor Emeritus of Inorganic Chemistry at the University of Illinois and dean of coordination chemists in the United States, died of a heart attack in Urbana, Illinois at the age of eighty-seven. He had been officially retired since 1972 but continued to spend seven hours per day in his office instead of his previously usual twelve hours. In the words of former student Daryle H. Busch, John "was responsible, more than any other single individual, for the continuing emphasis on research in Inorganic Chemistry, especially in the United States, from a near hiatus beginning sometime in the thirties and extending through the dark years of the Second World War, and was a central figure in the ultimate renaissance of that field during the late forties and fifties....Much of today's research in coordination chemistry has roots in his early studies."

John was born on May 27, 1904 at Golden, Colorado. His parents, John C. Bailar, Instructor in Chemistry at Golden's Colorado School of Mines, and Rachel Ella Work Bailar, were the first married couple to enrol in and graduate from the University of Colorado, from which John received his B.A. degree (*magna cum laude*) in 1924 and his M.A. degree in 1925. His master's thesis, "Nitrogen Tetrasulfide and Nitrogen Selenide: Preparation, Molecular Weight, and Some Properties," carried out under Horace B. Van Valkenburgh's direction, resulted in his first publication.[1] Like a number of the most prominent late 19th- and early 20th-century coordination chemists such as Sophus Mads Jørgensen, Alfred Werner, James Lewis Howe, and Lev Aleksandrovich Chugaev, John was trained as an organic chemist, entering inorganic chemistry "through the back door," so to speak.[2] He worked under the supervision of Moses Gomberg,[3] best known for his work on triphenylmethyl radicals, at the University of Michigan at Ann Arbor, where he received his Ph.D. degree in 1928 with a dissertation on substituted pinacols.[4]

In that same year John accepted a position as Instructor in Organic Chemistry at the University of Illinois at Urbana, where he remained for 63 years—almost half the period that the university had been in existence. He was assigned teaching duties in general chemistry, which was then primarily descriptive inorganic chemistry. He rose through the ranks, becoming Full Professor in 1943; he was also Secretary of the Chemistry Department (1937–1951) and Head of the Division of Inorganic Chemistry (1941–1967). On August 8, 1931 he married his former graduate teaching assistant Florence Leota Catherwood. The couple, whose marriage lasted almost 44 years (until Florence's death on March 13, 1975), were the parents of two sons, John Christian Bailar, III, currently Professor in the School of Medicine at McGill University, Toronto, and Benjamin Franklin Bailar, currently Dean of the Graduate School of Administration at Rice University, Houston and former Postmaster General of the United States. On June 12, 1976 John married Katharine (Kay) Reade Ross, whom he had known since childhood (Kay had been his babysitter).

During his graduate studies John had become interested in organic isomerism, but it was only during his second or third year at Illinois, while teaching a general chemistry class that he realized that isomerism was a phenomenon that could also exist in the inorganic realm.[5,6] A student logically but incorrectly referred to SbOCl, the product of the hydrolysis of antimony(III) chloride, as antimony hypochlorite rather than as antimony oxychloride or antimonyl chloride. In his literature search for examples of inorganic isomers John soon encountered coordination chemistry, and in his words, "My entire feeling toward the chemical profession changed. I had found my niche."

John considered his very first work on coordination chemistry,[7] carried out with



J.C. Bailar, Jr., aged 22; October, 1926.

senior undergraduate student Robert W. Auten, to be his most significant achievement: "It opened up a field. One doesn't often have the opportunity to do that."[8] The monumental, wide-ranging work of Alfred Werner, the founder of coordination chemistry,[9] was so comprehensive that many chemists assumed that all the important work in this field had already been done, and therefore coordination chemistry was relatively neglected until John's entry into the field. John educated several generations of coordination chemists (90 doctorates, 38 postdoctoral fellows, and many candidates for bachelor's and master's degrees), earning him the universally acknowledged title, "father of American coordination chemistry." A list of his former students, many of whom, inspired by his love of teaching, entered academia, reads like a "Who's Who" of inorganic and coordination chemistry. Not only was John elected President of the American Chemical Society (1959), but also three of his former students—Robert W. Parry (1982), Fred Basolo (1983), and Clayton F. Callis (1989)—attained this honour.

John's work with Auten established the inorganic counterpart of the well-known organic Walden inversion.[10] Werner observed the following reaction, which proceeds with a change in the sign of rotation,[11,12] which Werner realized need not be attributed to an inversion of configuration:

$$(-)\text{-}cis\text{-}[CoCl_2en_2]Cl + K_2CO_3 \rightarrow (+)\text{-}[CoCO_3en_2]Cl + 2KCl$$

Because Walden had converted (+)-chlorosuccinic acid to the(−)-hydroxy acid (malic acid) with KOH or Ag_2O, John hoped to repeat Werner's experiment with Ag_2CO_3 instead of K_2CO_3 to see if an inversion would result. At the time the Walden inversion mechanism had not been completely established, and John hoped that such an inversion with an octahedral configuration rather than a tetrahedral configuration might throw light on the matter. Bailar and Auten obtained an inversion of configuration in what was the first true example of a Walden inversion among inorganic compounds. Their 1934 article,[7] the first in a continuing 37-part series, "The Stereochemistry of Complex Inorganic Compounds," which extended to 1985, has attained the status of a classic. In John's words, "I owe a great deal to Robert Auten, for it was this piece of my work that originally caught the attention of the chemical public." Throughout his long career John continued his interest in inversion reactions.[13–16]

At the time that John began his career not only coordination chemistry but inorganic chemistry in general was languishing in the doldrums. In the United States inorganic chemists were exceedingly few, and most, like John, were overloaded with general chemistry teaching. There were few inorganic courses beyond the freshman course, little inorganic research was being carried out, and avenues for publication were limited.

At the Fall 1933 meeting of the American Chemical Society in Chicago, five inorganic chemists—Harold S. Booth, Ludwig F. Audrieth, W. Conard Fernelius, Warren C. Johnson, and Raymond E. Kirk—decided that there was a vital need for a series of volumes giving detailed, independently tested methods for the synthesis of inorganic compounds along the lines of *Organic Syntheses*, the series established by John's colleague at Illinois, Roger Adams. The five, who were soon joined by John, became the Editorial Board of the new journal, *Inorganic Syntheses*, the first volume of which appeared in 1939. Since its inception John was an active participant and motivating force in its affairs, contributing 16 syntheses and checking 5 others, especially in the early years when the fledgling publication needed considerable

support. John served as Editor-in-Chief of Volume IV (1953), and seven of his former students and three of his academic grandchildren (students of his former students) later served in a similar capacity.

Despite the growing success of *Inorganic Syntheses*, in the American Chemical Society, inorganic chemistry was not deemed worthy of divisional status until 1957 when the Division of Inorganic Chemistry was finally established largely through the efforts of John Bailar, who became the first Divisional Chairman and who has written a divisional history.[17] Similarly, the first journal in the English language devoted exclusively to the field, *Inorganic Chemistry*, began publication in 1962, again, largely through John's efforts. Thus the resurgence of the field after World War II, which the late Sir Ronald S. Nyholm[18] dubbed the renaissance in inorganic chemistry, owed much to the pioneering labors of John C. Bailar, Jr.

Although the stereochemistry of coordination compounds was John's primary interest, he and his students worked on a wide variety of subjects—synthesis; resolution into optical isomers of complexes of various coordination numbers and configurations; macrocyclic ligands; electrochemistry; electrodeposition and electroplating; polarography; homogeneous and heterogeneous catalysis; kinetics; stabilization of unusual oxidation states; dyes; spectra; unusual coordinating agents; coordination polymerization; solid state reactions, etc. With later (1990) Nobel chemistry laureate Elias J. Corey, he published a classic paper on octahedral trisdiamine complexes that led to applications of conformational analysis to coordination compounds.[19] Besides his almost 300 publications, he authored, co-authored, or edited nine monographs, texts, or laboratory manuals. His 834-page book, *The Chemistry of the Coordination Compounds*,[20] co-authored with 24 of his former students, summarized almost every aspect of the field, which, largely due to his teaching and research, was attracting more and more scholars. In addition to his work with research students, John was the Director of the university's General Chemistry and Student Placement Programs, and he spent considerable time with teaching and finding suitable positions for his undergraduate students.

Throughout his career John was active in the American Chemical Society, being Chairman of the Divisions of Chemical Education (1947), Physical and Inorganic Chemistry (1950), and Inorganic Chemistry (1957), Chairman of the Divisional Officers Group (1949), Chairman or member of numerous national committees, and Director (1958–1960). He was a member of Alpha Chi Sigma (from 1922), the National Research Council (member of various committees), the Electrochemical Society (1948–1962), the International Union of Pure and Applied Chemistry (IUPAC) (Treasurer, 1963–1971; Conference Delegate, 1959, 1961, 1963), Phi Beta Kappa, Sigma Xi, Phi Lambda Upsilon, and other scientific and fraternal organizations. He was elected an Honorary Fellow of the Indian Chemical Society (1974) and an Honorary Member of the Illinois State Academy of Sciences (1976) and the Chemical Society of Japan (1985). He was a member of the editorial or publication boards of twelve journals and the holder of honorary doctorates from four universities. He delivered more than one hundred fifty lectures in North and South America, Europe, Asia, and Australia; held more than a dozen lectureships; and was a visiting lecturer at five U.S. and three foreign universities as well as a plenary lecturer at four International Conferences on Coordination Chemistry (Rome, 1957; Krakow, 1970; Moscow, 1973; Boulder, 1977).

John's numerous honors include the Scientific Apparatus Makers' Association Award in Chemical Education (ACS, 1961), John R. Kuebler Award (AXΣ, 1962),

J.C. Bailar, Jr., date unknown.

Priestley Medal (ACS's highest award, 1964), Frank P. Dwyer Medal (Royal Society of New South Wales, 1965), Manufacturing Chemists Association Award for Excellence in College Chemistry Teaching (1968), Award for Distinguished Service in the Advancement of Inorganic Chemistry (ACS, 1972), J. Heyrovský Medal (Czechoslovakian Academy of Sciences, 1978), Monie Ferst Award for Education through Research (Sigma Xi, 1983), and Jubilee Medal, Institute of the Order of Lenin (USSR, 1989).

John was the first recipient of the University of Illinois' John C. Bailar, Jr. Medal, named in his honour, and his alma mater, the University of Michigan, named him Distinguished Alumnus for 1967. In recognition of his inestimable contributions to coordination chemistry, the Schweizerische Chemische Gesellschaft in Zürich, on September 3, 1966, at the centennial celebration of Alfred Werner's birthday (IX ICCC), presented John with the only Werner Gold Medal ever to be awarded, a fitting tribute to the elder statesman and prime mover of American coordination chemistry. Although his published works survive him, we shall all miss his wise advice, patient counsel, and cheerful personality.

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