

In Tribute to Linus Pauling: A Citation Laureate

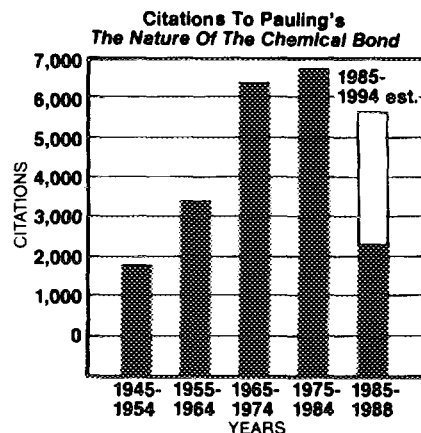
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This year marks the golden anniversary of Linus Pauling's *The Nature of the Chemical Bond and the Structure of Molecules and Crystals: An Introduction to Modern Structural Chemistry*. This classic 1939 book ranks as one of the greatest chemistry texts of the century.

In 1985, Pauling wrote an autobiographical commentary on *The Nature of the Chemical Bond* for the *Citation Classic*[®] section of the Institute for Scientific Information[®]'s *Current Contents*[®]. He noted that "from 1920 to 1939, great progress was made in the understanding of the nature of the chemical bond through the determination of the structure of crystals by X-ray diffraction and of the structure of gas molecules by electron diffraction and in the application of the theory of quantum mechanics." He continued, "the results of these studies were summarized in this book. The book has had a significant impact both on chemical education and on research in inorganic chemistry, organic chemistry, mineralogy, biochemistry, molecular biology, and medicine." (*Current Contents: Physical, Chemical & Earth Sciences*, January 28, 1985, page 16.)

Just how significant an impact the book has had over the years can be measured in part by the citations it has received. Since 1945, Pauling's book—in all editions and translations—has received between 15,000 and 20,000 explicit citations. That places the work among the top 10 scientific publications cited in our database and among the top five most cited books. The handful that do outrank Pauling's book are methods papers, such as the Lowry classic on protein measurement.

The accompanying bar graph gives the citation record for *The Nature of the Chemical Bond*, decade by decade since 1945, with an estimate for 1985 to 1994. The increase in citations over the four decades since 1945 is probably due largely to the exponential growth in the number of working scientists and in the number of their publications. In the decade 1975 to 1984, we indexed seven times the number of articles and 11 times the number



of citations than we did for the period 1945 to 1954. What is remarkable is that a 50-year-old book—or even a 28-year-old book, if one refers to the third edition published in 1960—gets cited at all by scientists today. The scientific literature is aging more rapidly all the time; the citation "half-life" of the typical article is declining. Yet *The Nature of the Chemical Bond* continues its usefulness. Last year alone, it pulled in over 600 citations. Only about 30 publications are now receiving 600 or more citations per year.

The Nature of the Chemical Bond, not surprisingly, ranks as Pauling's most cited work, but he has many other highly cited books and papers, which have been tabulated by his colleague Zelek S. Herman of the Linus Pauling Institute of Science and Medicine, Palo Alto, Calif. (see "The twenty-five most cited publications of Linus Pauling," in R.P. Huemer, editor, *The Roots of Molecular Medicine: A Tribute to Linus Pauling*, W.H. Freeman, New York, 1986, pages 254-59).

Considering the citation record described here, I can't resist thinking that if there ever were some sort of Nobel Prize for citations, Linus Pauling might well be a third-time laureate.