
This text is an update of the sixth edition published in 1994. The new version keeps the general format and illustrations of the earlier text but has added many new references and discussions of more current environmental issues throughout. It is written as an instructional text, complete with references as well as questions and problems at the end of each of the 27 chapters.

The first two chapters provide a conceptual overview, broadly defining environmental chemistry and describing the natural realms (water, air, and soil), their interactions with life (biosphere), and the impact of humans (anthroposphere) on all of these. The next 14 chapters detail the fundamentals of (a) water chemistry, with discussions of the important interactions of water with air and soil, the role of living organisms, sources of pollution, and human-kind’s attempts to deal with the consequences of these; (b) atmospheric chemistry, with discussions on sources of pollution, global warming, acid rain, ozone layer destruction, and smog; and (c) the geo-sphere, with discussions on soil chemistry and related problems, both those that occur naturally and those related to human activities.

Chapter 17 introduces the concept of industrial ecology, with numerous examples of the importance of anticipating, if possible, and managing the processes and products of industry to minimize environmental impact while optimizing utilization of resources. Chapter 18 applies some of these concepts to metal and nonmetal resources. Chapter 19 is a brief discussion of categories of hazardous wastes and their environmental chemistry, and Chapter 20 presents examples of industrial-ecological approaches to dealing with wastes. The emphasis here is on finding ways to minimize wastes, as well as ways to deal with wastes. Chapters 21–27 serve as reviews of salient features of biochemistry, toxicology, chemical methods, and analytical techniques for those with deficient backgrounds in these areas.

Overall I found this book informative and a good mental exercise. For example, it brought into focus for me how atmospheric chemistry works, something I thought I understood but really did not. It also clarified for me the job opportunities out there for good environmental chemists to deal with industrial-environmental problems.

I cannot recommend this book as a necessary read for every clinical chemist. The teaching text approach, at times at an introductory level and often repeating concepts in succeeding chapters, was tedious. This is not a criticism as much as an acknowledgment that this text covers a lot of territory and needs to introduce and repeat concepts in various contexts to keep the reader on target. Moreover, not all clinical chemists will find these topics interesting from a professional point of view.

For those who want a break from studying what goes on inside the body and who want to learn practically everything chemical going on outside the body, this may be just the right diversion!

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This nine-chapter biography is masterfully written, never dull, profusely illustrated, and spiced with an added, innovative 15-min “freebee” CD ROM. Arnold Orville Beckman (AOB) is a centenarian whose life touches all clinical chemists. Spatial limits preclude review of my own long experience with Beckman Instruments. Biomedical Engineering Services at my institution currently maintains 73 Beckman instruments in our clinical laboratory and mostly in our Wexner Research Institute.

AOB has had at least three interrelated careers, which are described in this book. He started as a budding scientist, inventor, and chemistry professor at the California Institute of Technology in 1928, where Linus Pauling was his young colleague. To supplement his income, AOB’s flair for creative electronic gadgetry (among other things) eventually led him into the business of instrumental design, manufacture, and marketing beginning in 1935.

Later in life, he and his wife, Mabel, launched an astounding humanitarian career of giving away most of his fortune to scientific, educational, and biomedical causes. The Arnold and Mabel Beckman Foundation was incorporated in 1977. That same year, he endowed the AACC with funds to support its annual Arnold O. Beckman Conference in Clinical Chemistry. In the 1980s, the pair donated $250 million to various causes through the Foundation, yet the balance remained the same thanks to the quality of the Foundation’s investments and income. AOB finally retired in 1993 when he turned over the philanthropy to a newly expanded board of directors.

To provide you with a brief idea of the interesting information contained in this book, I will review perhaps the most fascinating aspect of Beckman’s career. In his senior year (1922) in chemical engineering at the University of Illinois, Beckman was the vigorous editor of the departmental publication, Illinois Chemist. Its advertising manager and news editor was Glen Joseph, who went on to obtain his doctorate in chemistry at the University of Wisconsin in 1928, the same year that AOB received his at Caltech. It was Glen Joseph who later catalyzed AOB’s move out of academe and into the instrument manufacturing business.

Arnold Beckman was married to Mabel Meinzer in 1925, a truly romantic story involving a courtship of almost 7 years’ duration. To supplement his income from Caltech, AOB did consulting work, which in 1934 led him into directing his first com-
pany, the National Inking Appliance Co., housed in East Pasadena in a former sheet metal garage. This company produced a nonclogging postal meter ink, patented by AOB, as well as ribbon reinking devices, which were used by the parent organization, National Postal Meter Company of Los Angeles.

Glen Joseph was now a research chemist in a laboratory of the California Fruit Growers Exchange. He routinely measured the acidity of lemon juice, which related to its suitability for making byproducts such as pectin and as a source of citric acid. Joseph’s home-made apparatus featured a glass electrode and a sensitive galvanometer, both too delicate to withstand the rough field conditions under which they were used. He brought his problem to Arnold, who solved it using a sturdy vacuum tube amplifier and a more rugged glass electrode. The success of this effort produced a demand for more of these acidimeters.

In a matter of a few months, Beckman produced a new (patented) pH meter housed securely in an easily transported box. This unique item was handcrafted at the newly founded (in 1935) company, National Technical Laboratories (NTL), also of Pasadena. AOB was its director, but he held only 10% of its stock, whereas the owners of National Postal Meter held the rest. The Model G pH meter (Acidimeter) was marketed by Arthur H. Thomas Co. of Philadelphia. By the fall of 1937, Beckman and his team at NTL had greatly improved their own manufactured glass electrodes. Sales and profits of the meter soared despite the Great Depression of the 1930s. Meanwhile, AOB, who continued to perform his teaching duties conscientiously—with a flair—was also developing special inks for National Postal and guiding several other projects.

In 1939, the directors of NTL offered Beckman its presidency, a hefty salary, stock, and profit sharing. Knowing that producing the pH meter was only the beginning of a career tied to inventiveness and instrumentation for science and industry, he resigned his position at Caltech. The challenges he would now face and the fact that he would “run his own show” provided him his life’s most golden opportunity.

Not until the 1970s did Beckman focus on the clinical field. I will leave to you, the reader, the pleasant task of discovering the features of his past 30 years. But this biography offers more than that. Perhaps you will learn as I did that a giant of American science and industry has humbly walked among us, leaving an indelible legacy that benefits and guides humankind into the new millennium.

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Correction
In the article by Y. Yoon, J. Song, S.H. Hong, and J. Q Kim, entitled “Plasma Nitric Oxide Concentrations and Nitric Oxide Synthase Gene Polymorphisms in Coronary Artery Disease” (Clin Chem 2000;46:1626–30), in Table 3, the heading for controls should read (n = 128), not (n = 28). The error occurred in production. We apologize for any confusion this may have caused.