

# Random Thoughts . . .

## A BRIEF HISTORY OF *ELEMENTARY PRINCIPLES OF CHEMICAL PROCESSES*

RICHARD M. FELDER

North Carolina State University • Raleigh, NC 27695

*Elementary Principles of Chemical Processes* has been used as the introductory chemical engineering course text at nearly 150 American universities and many others elsewhere since it first appeared in 1978. The first two editions of the “red book” can still be found on the shelves of thousands of chemical engineers, mainly (as many alumni have told me) because of the conversion factors on the inside front cover. The red and blue edition came out in 1999 and may come to occupy the shelves of many future engineers, since the conversion factors are still there.

I am occasionally asked about how the book came to be, how long it took to write, who did which parts, and why anyone in his or her right mind would write an undergraduate textbook with the faculty reward system being what it is. I thought the responses to these inquiries might interest some *CEE* readers, so here they are.

I joined the N.C. State University faculty in July of 1969 and Ron Rousseau joined in August. In 1972, Alan Lesure of John Wiley & Sons invited Ron to write a stoichiometry book. Ron thought it sounded like a fine idea and said “sure,” and when soon afterwards he asked me if I’d like to come in on it, I thought it might be fun and said “sure.” Although I was slightly older and much wiser than Ron and had that critical extra month of academic experience, neither of us had a clue about writing textbooks. By the time we realized the magnitude of what we had agreed to do, we had invested far too much time and effort to back out.

The first edition of *EPCP* made its appearance in the spring of 1978 and was an almost instant success. Its success is not something we could have anticipated when we were writing it, however; in fact, we doubted that we’d ever finish it, among

other reasons because it seemed almost certain that one of us would first kill the other. Fortunately we managed to restrain ourselves, and we’re still good friends 23 years later.

Here is a chronology of the book’s development, as closely as I can recall it.

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**1972** Work begins on *A First Course in Chemical Engineering* (working title).

**1973** We write an outline and a sample chapter and send it to Wiley for review. The reviews are mixed. The chemical engineering editor at the time, Thurman Poston (“Post”), encourages us to continue, but says that we’ll need to get more chapters reviewed before he can issue a contract. We continue writing. In the fall the students in CHE 205 get drafts of the first few chapters as their course text. They discover about 25 mistakes per page of text and an uncountable number of glitches in the problems. The course ends before we ever get to



**Richard M. Felder** is Hoechst Celanese Professor Emeritus of Chemical Engineering at North Carolina State University. He received his BChE from City College of CUNY and his PhD from Princeton. He is coauthor of the text *Elementary Principles of Chemical Processes* (Wiley, 2000) and codirector of the ASEE National Effective Teaching Institute

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energy balances. (I hope those students eventually learned them somewhere.)

**1974** We send about five chapter manuscripts off for review and get back two good reviews and one declaring that the book has few redeeming features and no future. Post says that he needs to see still more chapters before deciding. We reply that perhaps it's time for us to open up discussions with McGraw-Hill. We get a contract by return mail.

One of the anonymous reviews is so insightful and well written that we persuade Post to hire the reviewer to critique the rest of the manuscript for us. The reviewer turns out to be a pair of professors from Iowa State—John Stevens and Dick Seagrave. We owe a great deal of the book's success to the comments we got from those two, even though we still bitterly resent the fact that no matter how many chapter-end problems we wrote they always wanted more.

**1975-1977** We continue to write chapter drafts, class-test them, find glitches, write new drafts, class-test them, and so on, until in the spring of 1977 we declare the manuscript perfect and send it off to Wiley. Much of 1977 is spent proofreading galleys and page proofs and writing a solution manual. We are extremely careful about the proofreading and are sure the book will be error-free.

Before we send the manuscript off, we set out to select a permanent title. Neither of us has any brilliant ideas, so what we do is write the words *Basic, Fundamental, Elementary, Introduction, Principles, Elements, Methods, Chemical, Engineering, Stoichiometry, and Processes* on pieces of paper and shuffle them into every combination that makes sense. When we get to *Elementary Principles of Chemical Processes* we look at each other, shrug, say "Good as anything else, I guess" or words to that effect, and make that the title.

**1978** The first printing appears. In the fall we use the book in its published form for the first time and offer the students 25¢ for each previously undiscovered error they come up with in the unlikely event that any survived our proofing. We stop counting after 200.

**1979-1980** By the third printing we are offering \$1 for each new mistake and are not getting many takers. By its third year the text has taken over most of the market.

**1981-2001** The text continues to enjoy success. A Spanish translation, the second edition (1986), a Chinese translation, an International edition, and the third edition with bundled CD-ROM (1999) all appear. We live happily ever after.

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As I mentioned before, I am often asked who did what. Here's the answer. Problems containing weird characters with unpronounceable names are mostly mine. All case studies in the first two editions and two out of three in the third edition are Ron's. The rest of the book bounced back and forth between us so much that it's impossible to ascribe any of it to either author, except that any remaining mistakes are Ron's.

I am also occasionally asked how I account for the book's success. Of course it's anybody's guess, but I believe a large part of it is that we wrote the text for students and not to impress potential adopters, and both our colleagues and their students appreciated it. We emphasized physical and chemical phenomena and minimized abstract mathematical formalism—there would be time enough for that later in the curriculum. We provided one or more examples to illustrate every problem-solving procedure, included self-tests so the students could make sure they grasped the main ideas in every section, and wrote close to 700 chapter-end problems and three comprehensive case studies that applied the text material to real process systems. We even took a page from Octave Levenspiel's playbook and included some humor.

To be fair, I must note that not all of our colleagues welcomed our approach, and the text has on occasion been labeled insufficiently rigorous. My favorite criticism was one I overheard in an AIChE meeting hospitality suite some years ago, when one professor snorted to another that he found Felder and Rousseau "sophomoric"—an interesting way to insult a sophomore textbook. I was tempted to thank him but instead just filed the comment away for possible future use and continued threading my way to the bar.

Finally, is it worth it to spend the years it takes to write a textbook? Unquestionably, it is. Nothing compares with the satisfaction Ron and I feel when we see students carrying our book, or when they write us from campuses all over the world telling us how our splendidly written and inspirational text has changed their lives (usually followed by a request for a copy of the solution manual). The nickel-per-hour return we get in royalties is just icing on the cake. □

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