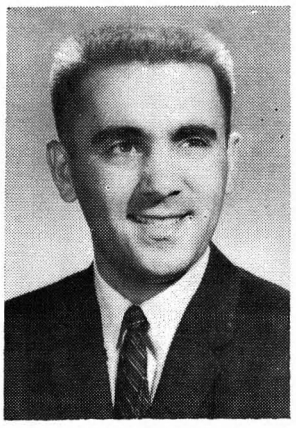
ChE views and opinions

CHEMICAL ENGINEERING EDUCATION REVISITED

LOUIS THEODORE
Manhattan College
Riverdale, New York 10471

LAST YEAR, Joe Reynolds—my department chairman and long-time friend—approached me about the possibility of my attending the Summer School Workshop for Chemical Engineering Faculty. He felt the trip would do me good since most of my professional interests and consulting activities in the last six years have been in air pollution. In addition, my wife was excited about the possibility of another trip to the Colorado area. The Workshop, conducted in Snowmass, Colorado, provided the right atmosphere for a conference of this nature. A total of 36 sessions were offered in the program with topics varying from Unified Rate Concepts to Workload Evaluation.

After some manipulation, I had Mike Williams, one of the Workshop Directors, assign me to the following sessions on kinetics:



Louis Theodore received his B.Ch.E. from the Cooper Union in 1955 and his M.Ch.E. (1957) and Eng.Sc.D. (1964) from New York University. He is presently Director of Research for Manhattan College's ChE Department. Dr. Theodore has had wide experience as an industrial consultant and lecturer, and is the author or co-author of numerous publications and texts. Two main areas of interest are in air pollution and computer application.

1. **Applied Chemical Kinetics.**
2. **Catalysts and Physical Chemistry of Catalyst Systems.**
3. **Chemical Reaction Engineering.**

I specifically requested these sessions because I teach Chemical Reactor Design, a required senior-level course in ChE at Manhattan College. I had always felt that the course suffered somewhat in that I did not provide enough practical applications. I hoped that attending these sessions would help alleviate this problem. Unfortunately, this proved not to be the case. The lectures, which primarily centered on program curricula and course content, emphasized the theoretical rather than the design or pragmatic approach to ChE. For example, Session (1): Applied Chemical Kinetics, contained no applications, at least not as I have come to know the meaning of that term as an engineer. As another colleague at the workshop commented: the use of the word "applied" by this professor was an insult to any engineer's intelligence. These sessions served to substantiate the fears of a good number of ChE professors and industrial personnel: education in ChE programs at so many of the "big-name" schools has gone off the deep end. Course content seems to emphasize the professor's research and/or professional interests with little or no regard for the real needs of a ChE student. So much time is apparently spent on material that will serve no use to the practicing engineer. For example, the emphasis on the presentation at Session 1 was on kinetic theory. Yet, I would defy anyone to provide me with a case study where a reactor was designed using kinetic theory. Much of this useless material could be removed from course offerings if the professor would simply ask (and answer) the following question before entering class: Will the student ever use this material?

The same criticisms of the kinetics course offerings can also be leveled at so many other courses. I say this because of the recent prolifera-

tions of texts in ChE that have emphasized the fundamental rather than the engineering approach. Texts seem to be written by professors for their colleagues rather than their students. This has caused several of us at Manhattan to use earlier editions of ChE publications.

I would issue a call to those responsible individuals in ChE education to put an end to this nonsense. Something has to be done, and it *must* be done soon.

REFERENCE

1. CEP, August 1976, pages 13-16.

ChE book reviews

STRATEGY OF POLLUTION CONTROL

By P. Mac Berthouex and Dale F. Rudd, John Wiley and Sons, 1977.
Reviewed by Noel de Nevers, University of Utah.

This book is very similar in organization, style, and contents to "Process Synthesis" by Rudd, Powers and Siirola, Prentice-Hall, 1973. It has the same basic organization and style and borrows several large sections verbatim from that book. Those who like that book will like this one.

In this book, Professor Rudd has teamed with Professor Berthouex, who is an expert on waste water treatment and water supply, to produce a book which might better be named, "Process Synthesis, Rewritten to Emphasize Water Pollution Control."

In both books, a very brief and sketchy treatment is given of conservation of mass, conservation of energy, equilibrium relationships, and rate equations. The subjects are illustrated by numerous excellent examples.

It is interesting to speculate what the audience for this book will be. The reviewer has personally used "Process Synthesis" as a text for an "Introduction to Chemical Engineering for Freshman" course. The response seems to be that the professor likes the book and the students don't. It is, to some extent, over their heads. However, it does not seem to fit logically into the Chemical Engineering curriculum anywhere else. Similarly, "Strategy of Pollution Control" seems to have no obvious place in the Chemical Engineering curriculum. The emphasis is very heavily upon waste water treatment. As a Chemical Engineer who does not know a great deal about waste water treatment, the reviewer found the discussions and examples there very interesting. But he scarcely feels competent to teach a course on waste water treatment based on the availability of this textbook (and knowing the obvious jurisdictional conflict with the active water pollution control group in our Civil Engineering Department).

The best part of this book (as is the best part of "Process Synthesis") is the abundance of well-worked out and very interesting examples. In both books, these are truly outstanding, and justify the purchase of the book by many engineers merely to have the opportunity to study these interesting examples.

The reviewer has several minor criticisms; first, the title of the book is misleading. Very little is said about the strategy of pollution control. Mostly, the discussion is about internal optimization of waste water treatment facilities given a set of externally applied constraints which the engineer has relatively little to say about. "Strategy of Pollution Control" implies a global view of what we ought to be doing in the pollution control field, given our limited resources and limited knowledge of the true effects of various pollutants on ourselves and other parts of the ecosystem. Second, although the authors have provided some literature references, they are not as careful in citing sources for their material as they should be. For example, figures 7.5.8 and 7.5.17 are direct copies of figures 5.82 and 20.99 of Perry "Chemical Engineers Handbook," Fifth Edition. This is not mentioned at all in the place where these figures are introduced, and the only clue the reader is given that these might be from that source is a reference in the bibliography at the end of that chapter to Perry's as a general reference source in this area. Third, the three-page, double-spaced index is inadequate.

In summary, chemical engineers who wish to see a chemical engineer's view of the whole waste water treatment problem, with various other pieces of information about other pollution problems appended, will find this a very interesting and useful book. The reviewer sees no place where it will fit in as a textbook in any standard chemical engineering course except if there is a faculty member who is strongly involved in waste water treatment, and who can teach this subject without jurisdictional conflict with the civil engineers. □