Now, all we have to do is designate someone to answer all the questions explicit and implicit in this plan. What's indispensable in our current curriculum? What tracks should be considered? What are the likely short-range and long-range demands for graduates from each of these tracks? In light of the answers to the previous question, what tracks should actually be instituted? What should the required and optional courses be in each track? What really needs to be taught in each course? Who's going to design and teach all those courses? How much is it going to cost to do all this? Who will bear the cost?

Who will come up with the answers? Certainly not me—I'm just one person, and I'm not getting paid for this. If history is a guide, designing and implementing a plan of this magnitude demands no less than a blue-ribbon panel with three or more corporate executives at the vice-president level and at least $500,000 support over a three-year period from the National Science Foundation.

However, I really believe that the details of implementation are of secondary importance at this time. We're all struggling to answer the focal question of this paper—what should we remove from the chemical engineering curriculum to make room for new material? Sometimes when you can't come up with a reasonable answer to a question no matter how hard you try, you should consider the possibility that you haven't asked the right question.

I think that's the case here. The premise that underlies the question is that there's such a thing as "The Chemical Engineering Curriculum"—one size fits all. If we back off that premise, and acknowledge that those coming to us have a spectrum of needs—most of which don't involve preparation for the PhD qualifying examination—then we find ourselves asking a different question: "How can we structure our program to best meet the needs of most of our students?" Since a single rigidly-structured curriculum presided over by a faculty composed exclusively of research scientists can't possibly meet those needs, we should be led to seek diversity and flexibility in both our curricula and our faculties. I believe that in this direction lie our answers. ☐

ChE book reviews

BASIC PROGRAMS FOR CHEMICAL ENGINEERS
by Dennis Wright
Van Norstrand Reinhold Company, 1986,
340 pages, $32.95.

Reviewed by
Jeffrey J. Siirola
Eastman Kodak Company

The title of this book is to be taken both ways: a collection of very elementary chemical engineering computer programs, all written in the BASIC computer language. The stated purpose of the book is to provide engineers who have access to personal computers with ready-to-be-copied listings to enable solutions to problems in thermodynamics, mass and heat transfer, design, economics, *etc.* Included with each listing is a brief explanation of the equations on which the program is based and an example of typical input and output. In addition, many of the routines include tables of properties data for selected compounds or situations.

With less than three dozen routines, the book covers only a small fraction of chemical engineering computation. Included, however, are data regression, Newton-Raphson and Runge-Kutta equation solving, shell-and-tube and double pipe heat exchange, Fenske-Underwood-Gilliland distillation, plate effi-ciency and hydraulics, stoichiometry, chemical and vapor-liquid equilibria, prediction of critical and other physical properties of pure components, the design and economics of packed towers, heat exchangers, cyclones, and orifices, and a few other miscellaneous topics. To facilitate transcription, most routines are very short, averaging just over 100 lines of code. As much of the BASIC code is often associated with input-output and data, such short routines are of necessity quite simplified.

This book is not highly recommended for students. For computational situations appropriate to the sophistication of routines contained here, the effort to understand and transcribe listings error-free probably exceeds that required to code the simplified equations from scratch. For more serious work, far more complete and robust routines are widely available in the form of both software packages and listing. ☐

ChE letters

HOUGEN TRIBUTE APPRECIATED
Editor:

It was gratifying, indeed, to read the tributes to my brother, Olaf, written both by you and Bob Bird. Thank you for these testimonials and your role in their publication.

Joel O. Hougen
University of Texas at Austin