There are some oddities in the manual. The design information appendix includes useful items such as pipe-fitting dimensions and a drainage time nomograph for variously shaped vessels. This appendix also includes recommended dimensions for stairs, ladders and ramps at various angles.

The compiled nature of the book is evident from the preface, which includes references to four different appendices. The book actually has seven appendices of which three of the four mentioned in the preface are in a different sequence in the book than described in the preface. Corrosion data presented in an appendix for various metals that repeatedly lists one of the metals for consideration as Monet instead of Monel.

This truly is a water quality control handbook. It is an accumulation of the what, why and how of water pollution and its control. Its worth is in the convenience of having disparate yet interrelated information brought together in a single volume. If you deal with topic regularly, you’ll find enough value here to overlook the politics.

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Introduction to Transport Phenomena
W. Thomson
Prentice Hall PTR, Upper Saddle River, NJ, 510 pp., indexed, $97, 2000

The year 1960 is historic for chemical engineering. That is the year Bird, Stewart and Lightfoot published “Transport Phenomena.” In that book, the authors implicitly demonstrated that momentum, heat and mass transports were a unified subject. Their book was recognized at its publication as a breakthrough in the presentation of the engineering science from which chemical engineering grows.

Prof. Sherwood acknowledged as much in his review of “Transport Phenomena” in 1961. However, he tempered his praise with caution. First, he warned that the book would give students the impression that every chemical engineering problem is analytically solvable. Second, “Transport Phenomena” does not explain the use of transfer coefficients. And third, only those mathematically oriented students with sufficient mathematical training can glean the raison d’etat underlying the text; i.e., that momentum, heat and mass transport are one, the same phenomenologically.
However, all the issues raised by Prof. Sherwood have been successfully confronted in “Introduction to Transport Phenomena,” by Prof. Thomson. First, Thomson clearly states that not all chemical engineering problems are analytically solvable. That is why transfer coefficients are measured and used, thus addressing Sherwood’s second issue. And third, in Thomson’s textbook, the student can see the engineering science at the heart of chemical engineering without needing an applied mathematician’s license.

“Introduction to Transport Phenomena” has three parts: Part I presents molecular transport; Part II discusses convective transport; and Part III outlines design procedures using macroscopic calculations. The book has five appendices. Appendix 1 presents the generalized equations of change. Appendix 2 describes the use of the MATLAB ODE solver. Lennard-Jones and collision integrals are tabulated in Appendix 3. Appendix 4 briefly discusses the error function and Appendix 5 contains tables of viscosities and thermal conductivities.

Each chapter contains several solved examples and at least one example using MATLAB to achieve a solution. There is a variety of problems at the end of each chapter. As with any first printing, there are a number of typos. Also, the bounded integrals are difficult to read. However, the most annoying feature is the constant reference to the “phony film” present at interfaces. This sobriquet wears thin after the second encounter. Walter Nernst, its inventor, would object to its first usage. Thomson should spend more time explaining that the phony film is a method for picturing the presence of a driving force at an interface.

Nonetheless, this book is definitely the best undergraduate transport phenomena textbook to appear since Bird, Stewart and Lightfoot’s book in 1960. “Introduction to Transport Phenomena” should be on every practicing chemical engineer’s bookshelf.

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