teresting.

The reader is encouraged to develop a basic skill in problem solving. A general technique is outlined, but it is difficult to see that the example solutions presented were in fact arrived at using the recommended technique. More detailed, step-by-step applications of the technique to specific examples, describing in detail why certain bases and system boundaries were chosen and others rejected, would help the reader to understand and assimilate the basic elements of problem solving.

The goal of putting between one set of covers the basic principles and calculations of chemical engineering is an ambitious one, and this book is a carefully prepared and quite successful attempt to reach that goal. However, because of the broad scope, thin coverage, and emphasis on calculations, an introductory course based on this book must be a frustrating experience for many students. It seems somewhat like being introduced to half a dozen very interesting people under circumstances which allow one only to focus on the height, weight, and state of dress of each. In such a situation, one may see what more is there and be content to wait for a chance at in-depth involvement. Unfortunately, the potential fascination may never be recognized and one may depart quickly for more apparent and immediate rewards elsewhere. Chemical engineering deserves a more intellectually substantive introduction than would result from the strict adherence to this text.

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Dust Explosions and Fires, K. N. Palmer, Chapman and Hall Ltd., London (1973). 396 pages. $18.50.

Dust explosions and fires have been the cause of many major industrial accidents and coal mining disasters. Much research has been devoted to this subject at various government, university, and industrial laboratories. Unfortunately, the results of these studies have been scattered around the literature in the form of laboratory reports, papers presented at Symposia of the Combustion Institute, AIChE, and other professional societies and in a number of scientific journals. Dr. Palmer, whose section at the Fire Research Station, Borehamwood, England, has made significant original contributions to this field, has taken upon himself the formidable task of assembling and organizing this information in one book. The result is a valuable, lucid treatise that may be used not only by researchers in the field but also by plant design engineers, industrial safety and fire officials, and students of fire technology.

The book begins with a short introduction to the problem followed by a discussion of standard dust explosibility tests used in various countries and of the application and interpretation of the results of these tests. The mechanism of flame propagation in dust clouds and the factors that control the rate of propagation are next examined. The author then turns to practical engineering applications by identifying common sources of dust ignition and presenting methods for protecting against dust explosions and fires. Guidelines for the design of plants in which flammable dusts are generated or handled are also provided. A comprehensive table in the appendix provides pertinent explosibility properties of dusts of over 400 materials ranging from acetamide to zirconium hydride and including such interesting things as aluminum, barley, dextrin, egg white, garlic, gum tragacanth, lycopodium, moss (Irish), peanut hull, shellac and tea.

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Vapor Liquid Equilibria, L. R. Oellrich, U. J. Plöcker, and H. Knapp, Institute of Thermodynamics, Technical University of Berlin.

An interesting and valuable bibliography of vapor-liquid equilibria data for cryogenic mixtures has recently been published as a private document. Mixture components comprise those materials boiling below 350°K at one atmosphere.

The review covers the period 1900 to 1972. Interested readers may obtain copies by sending negotiable checks in the amount of DM 10 ($4 US) to:

Berliner Bank
Institut für Thermodynamik
Kto. Nr. 996 179 5100

Transfer Processes, D. K. Edwards, V. E. Denny, and A. F. Mills, Holt, Rinehart, Winston, Inc., New York (1973). 361 pages. $15.00.

This book is intended and is well suited for use as an introductory text in heat and mass transfer. Momentum transfer is treated only slightly and a previous course in fluid mechanics or a supplementary text would be beneficial when using this book as a textbook. The basic approach of the authors is to introduce the various transport phenomena from a macroscopic point of view, then treat the transfer process from a microscopic viewpoint, and finally to consider some significant engineering design problems. This sequence will most probably have the advantage of helping to maintain student interest. The calculus level required for a student studying from this book is a knowledge of ordinary differential equations, although penetration theory solutions are discussed for transient conduction and for gas absorption in falling liquid films. There are a wide variety of interesting example problems and these problems are one of the strongest aspects of the book.

The book is organized so that analogous phenomena in heat and mass transport are considered together. Chapters 2 and 3 consider one-dimensional heat conduction and mass diffusion. The concept of transport resistances and transfer coefficients, finite difference methods for solution of the transient diffusion equation, and mass transfer in porous media are treated in these two chapters. Chapters 4 and 5 deal with convective transport. Both forced and free convection are considered and turbulent transport is treated by way of dimensionless correlations. Radiation transfer and free molecule transport are the subjects of Chapter 6. Simple kinetic theory arguments are used in Chapter 7 to derive relationships for the transport properties. Neutron transport is also briefly discussed in Chapter 7. The phenomenological approach is used in Chapter 8 to treat turbulent transfer processes. Chapters 9 and 10 are concerned with equipment design. The concepts of overall transfer coefficients and macroscopic balances are used to design heat and mass exchangers.

References are given at the end of each chapter to other textbooks and these references are often briefly summarized. However, a minor criticism is that no references to the research journals are given. The book could use more polish; however, it is well recommended and should find wide use as an introductory text.

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Gas Analysis Instrumentation, A. Verdin, Halsted Press, New York (1973). 414 pages. $26.00.

This comprehensive book can serve equally well as an introductory text for a novice in the field and as a reference source for an experienced instrumentation engineer. It pulls to-

gether a wide variety of gas measurement techniques in a concise form and presents each case in a realistic manner. The first portion of the book is devoted to describing the various methods and devices currently being used for gas analysis and the theories upon which they are based. For each case sufficient information is presented to provide the reader with a basic understanding of the technique without involving him in esoteric subtleties. The advantages and drawbacks of the various devices are clearly indicated, with alternative approaches recommended when appropriate. Throughout this first part the author lists many commercially available instruments and their specifications as examples of existing hardware. While this may have some immediate value, I feel that it does not contribute significantly to the contents of the book since such models and specifications have a way of changing rather rapidly. However, this does not detract from the overall utility of the book.

Applications are emphasized in the second section. Here again, the author took a practical approach in his presentation. The more detailed examples are well chosen and illustrative, including process information along with the recommended instrumentation. A wide variety of applications is covered in this section, and in my opinion, it is done quite well.

The third portion of the book is concerned with sampling and calibration procedures and safety considerations. The chapter on safety is of particular interest to me since many authors ignore this very important area. Too many times I have seen an otherwise safe area made hazardous by improper instrumentation, and unfortunately this quite often is due to ignorance of the hazards such instruments can introduce. It is commendable that this chapter was included.

In summary, I think this is a worthwhile book and one which should be widely used by instrumentation engineers.

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Principles of Heat Transfer, 3rd Edit., Frank Kreith, Intext Educational Publishers, New York (1973). 656 pages. $15.00.

When can a book be considered as a text for an introductory course? One answer would be "when the exposition of the subject matter is lucid, in simple and comprehensive language, at the same time providing a guide to the literature for an ambitious student." The third edition of this already well-known book meets these criteria for understanding the basics of heat transfer quite admirably.

The topics covered are essentially the same as in two earlier editions, namely, conduction and radiative and convection heat transfer. However, the author has made several changes in the treatment of the subject, keeping in view the modern trends in problem analysis. In the chapters on conduction and radiation, examples are worked out illustrating the numerical methods in solving heat transfer problems using a computer. However, similar illustrations have not been extended to problems in convection heat transfer. This, in the opinion of this reviewer, is an unfortunate omission, considering that a chemical engineer is much more likely to be concerned with fluid flow heat transfer problems. Also, the utility of providing detailed Fortran programs is doubtful especially when the flow charts given serve much the same purpose. Although the book is slightly biased towards numerical solutions and in spite of the modern trend of running to a computer and cranking the results out, it is gratifying to see a balanced treatment of other techniques such as analytical, graphical, analogical methods. This edition would have better served its purpose had there been a section discussing some of the problems in numerical methods such as the truncation errors, roundoff errors, and instabilities.

The author claims to have rewritten the chapter on radiation. But except for the slightly better description of black body radiation, the chapter is the same as in the earlier edition. A section on gaseous radiation is included. The section on the utilization of solar energy has been omitted—an unfortunate act, especially because of the renewed interest in solar energy generated by the energy crises. The chapter dealing with high speed flow heat transfer has been dropped. The author gives only lip service to SI units. Though conversion factors and tables of units of the physical parameters in SI units are given, not a single problem of any worth has been illustrated in SI.

A good feature of this book, which stands in contrast to many other similar books on heat transfer, is the provision of the summary tables at the end of the chapters on convection. The ready accessibility to formulae provided by these tables makes it a very useful reference book for practicing engineers and students alike.

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ERRATA

The four figures in "Further Work on the Flow Through Periodically Constricted Tubes—A Reply" by A. C. Payatakes, C. Tien, and R. M. Turian [19, 1036 (1973)] should have appeared in the immediately preceding Note "Effect of Geometric Parameters on the Friction Factor in Periodically Constricted Tubes" by F. A. L. Dullien, and M. I. S. Azzam [19, 1036 (1973)].

In "Prediction of Gas-Liquid Holdup for Inclined Flows" by E. J. Greskovich [19, 1060 (1973)], Table 1 should read:

θ	$\eta_{\lambda=0}$	Fr_m
2°	0.32	0.4
	0.22	0.8
	0.13	2.0
6°	0.39	0.4
	0.28	0.8
	0.19	2.0
10°	0.41	0.4
	0.31	0.8
	0.22	2.0

E. J. GRESKOVICH

In "Moment Analysis of Experiments in Gel Permeation Chromatography" by R. V. Mehta, R. L. Merson, and B. J. McCoy [19, 1068 (1973)], the eighth term in the Notation should read $N'_{Pe} = 2R_h v/D_{AB}$, Peclet number based on hydraulic radius R_h.

B. J. McCOY

In the paper "Dissolution of a Homogeneous Porous Medium by Surface Reaction" by M. C. Glover and J. A. Guin [19, 1190 (1973)], the following corrections should be made:

The variable $z = (\alpha + 1)\, A/a$.

Equation (13) should read

$$C_v{}^{\alpha} = \sum_{k=0}^{v} \frac{(-1)^k \binom{v}{k} \left(\frac{\alpha+1}{a}\right)^{k+1} M_k}{\Gamma(k+\alpha+1)}$$

Equation (16) should read

$$I_j = \left(\frac{a}{\alpha+1}\right)^{3/2+j} \sum_{n=0}^{N} C_n{}^{\alpha} D_n{}^{\alpha} \frac{\Gamma(n+\alpha+1)}{n!}$$

All calculations were done with the correct version of the equations, and thus all results presented in the paper are correct.

J. A. GUIN

(Continued on next page)