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

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

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.

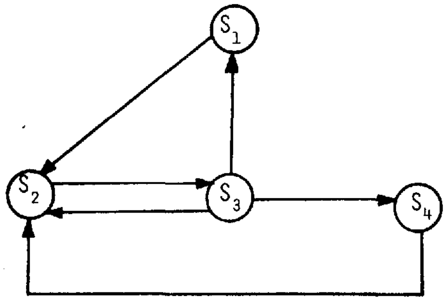
J. A. GUIN

(Continued on next page)

LETTERS TO THE EDITOR

TO THE EDITOR

In a recent article by Pho and Lapidus (1973), the authors utilize signal flow diagrams (where streams are represented by nodes) in the course of decomposition of process flow diagrams (where process units are represented by nodes and streams by edges). However, the example chosen to illustrate reduction of a signal flow diagram (Figure 3, here reproduced with its associated loop matrix as Figure 1) corresponds to no realizable process flow diagram. The reduction procedure illustrated is valid, but the example is not meaningful in the context of process flow diagram. In a process flow diagram, a stream is a simple, unidirectional connection between two units. Since S_3 leads into S_1 and into S_2, the latter two must be output of a unit to which S_3 is an input. However, since S_2 and S_1 are part of loop 2 (Figure 1B), they cannot both be outputs of the same unit. Thus, S_1 cannot be an output of the unit to which S_3 is an input. This contradicts the earlier argument that S_1 must be an output of such a unit. A similar contradiction arises when one considers S_4 instead of S_1. Thus the signal flow diagram is not associated with any system of units and connecting streams.



(A)

	S_1	S_2	S_3	S_4
l_1		1	1	
l_2	1	1	1	
l_3		1	1	1

(B)

Fig. 1. An example of unrealizable signal flow diagram and loop matrix.

Furthermore, the accompanying loop matrix, shown in Figure 1B, is also inconsistent with the characteristics of loop matrices derived from process flow diagrams. It can be shown that no row of a loop matrix can contain any other row (that is, it cannot have all the entries of any other row). This follows from the definition of simple loops. It might be noted that for a system with 4 streams, there are at most two loops of length two or more, whereas the signal flow diagram presented by the authors shows three such loops.

This all might warn of possible dangers in working with signal flow diagrams unless they are carefully checked for correspondence with the configuration of the process in question.

LITERATURE CITED

Pho, T. K., and L. Lapidus, "An Optimum Tearing Algorithm for Recycle Systems," *AIChE J.*, 19, 1170 (1973).

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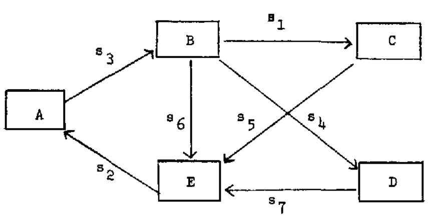
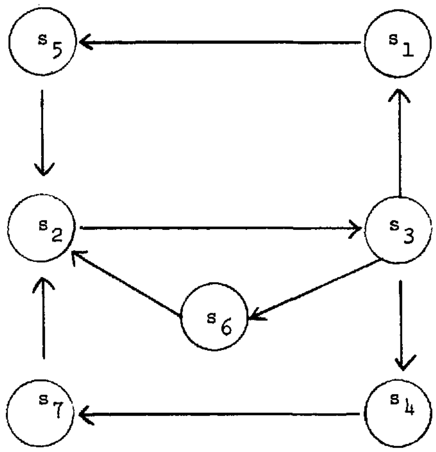
TO THE EDITOR: COMMENTS ON THE LETTER TO THE EDITOR BY R. UPADHYE

While it is true that the example illustrated as Figure 3 in the paper by Pho-Lapidus is unrealizable in terms of conversion to a real process flow diagram, this in no way detracts from the paper. Such signal flow diagrams are often the result of repeated reductions of an initial flow diagram by tearing algorithms such as those proposed in the paper. Consequently, the example shown is not limited only to a realizable signal flow diagram. Further, we must point out that the initial flow diagram from which we began our algorithm is process realizable since it was derived directly from an original process flow diagram. Because we are only interested in locating an optimum torn set, the realizability of a reduced signal flow diagram from the initial graph is largely immaterial.

To illustrate this point further consider the process flow diagram:



Its initial signal flow diagram can be shown to be



If we declare stream nodes s_5, s_6, and s_7 as being ineligible, the signal flow diagram of Figure 3 will result.

Obviously the above demonstrates how an unrealizable signal flow diagram can be derived from its initial realizable graph.

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ERRATA (continued)

In "On the Maximum Temperature Rise in Gas-Solid Reactions" by H. Y. Sohn [*AIChE J.*, 19, 191 (1973)], the following corrections should be made:

1. The definition of A given by Equation (7) should read

$$A \equiv \frac{C_B h\, F_p}{\rho_s C_s D_e n C_A} \left(\frac{F_p V_p}{A_p} \right)$$

where F_p is a shape factor which has the value of 1, 2, or 3, respectively, for an infinite slab, an infinite cylinder, or a sphere. It is further noted that

$$\frac{F_p V_p}{A_p} = a$$

The computed results remain applicable for the new definition of A, and thus for all three basic geometries (F_p = 1, 2, and 3). Furthermore, the results are also expected to be approximately valid for pellet geometries other than the three basic ones, if a proper value of F_p is used.

2. Equation (13) should read

$$e^{-\omega^2} \cdot D(\omega) = \ldots\ldots$$

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