Financial Decision Making in the Process Industry, Donald R. Woods, Prentice Hall, Inc., Englewood Cliffs, N.J. 324 pages, $16.95.

This treatise gives a comprehensive introduction to the various methods of judging the financial viability of capital ventures. It is both timely and broad in scope. The author has a lucid delivery and makes particularly good use of graphical illustrations and tables.

In most areas the author meets his stated objective—to describe methods of calculating different financial attractiveness criteria. One outstanding deficiency is the lack of material on criteria to use when there is risk or uncertainty. No mention is made of even such fundamental tools as Monte Carlo. The suggestion on page 142 that the present value criteria can account for risk through variation in interest rate is, in general, a poor technique since it leads to excessive compounding of risk on middle-to long term projects.

In treating the concepts of marginal costs and marginal revenues the author fails to mention competitive reaction and lowered prices which is an essential factor in judging true marginal revenues.

In my opinion the space devoted to extensive mathematical derivations would be better used by including more sample problems. A greater variety of sample problems would be useful in guiding both students and practitioners.

As a summary view, *Financial Decision Making in the Process Industry* fills a need in decision making literature and, should be useful to the college student and to the young practicing engineers in relating engineering knowledge to the financial aspects of business. The bibliography included provides an excellent source of references in areas the reader may wish to pursue further.

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Pollution Engineering Practice Handbook, P. N. Cheremisinoff and R. A. Young, Ann Arbor Science, 1973 pages. $29.50.

Cheremisinoff and Young are associate editor and editor, respectively, of *Pollution Engineering* magazine. They have collected a large number of articles on all aspects of pollution from the first 5 volumes of *Pollution Engineering* to form the *Pollution Engineering Practice Handbook.* Two strong points of this handbook are that almost every aspect of pollution is covered in at least some detail, and that practical, proven techniques for solving problems are stressed, actual case studies being used liberally. The weaknesses of this work come from the fact that it is a collection of previously published articles. This means that some topics are very complete but others are less so. For example, in the wastewater area, disinfection is covered rather thoroughly but chemical treatment is barely more than mentioned. Some topics are covered quantitatively with design equations and others are treated qualitatively. Because the handbook has been abstracted from previously published articles, the material for any one topic does not always follow logically. In the wastewater area, for example, one would expect to find (in a handbook) a section listing terminology and definitions. This type of information can be found only with difficulty and by going back and forth between several different articles.

The *Pollution Engineering Practice Handbook* will have its greatest value to the engineer who wants practical information on a specific aspect of the pollution control field. This is best illustrated by the topic (in the Air Pollution section) on "SO_2 Control in Small Boilers" and "Plastic Pipe for Sewers" (in the Wastewater section). As with any handbook, it does have something for everyone. My wife read with interest the chapter on Traffic Noise in order to figure out how to keep the street traffic noises out of her kitchen.

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ERRATA

In Vol. 21, No. 4, July 1975 Continuous Production of Polystyrene in a Tubular Reactor: Part 1, 1) Page 690, Equation in upper left hand corner should read:

$$S_a^2 = \frac{\sum_{j=1}^{9} (\overline{X}_1 - \overline{X}_2)^2{}_j}{2 \times 8} \qquad \text{(excluding } j = 8\text{)}$$

Part 2, 1) Page 693, Equation (23) should read:

$$C_{mo} V_{zo} \frac{\partial x_m}{\partial z} = R_p + \frac{D}{r} \frac{\partial}{\partial r} \left(r \frac{\partial x_m}{\partial r} \right) C_{mo}$$

) Page 693:

$${}_p = C_{mo}(1 - x_m) \left[k_m{}^2 \left(\frac{a + b x_m}{\rho_o} \right)^3 f C_{Io}(1 - x_I) + k_{mt}{}^2 \left(\frac{a + b x_m}{\rho_o} \right)^2 \right]^{1/2}$$

) Page 694, Equation (27) should read:

$$C_{mo} V_o \frac{d x_m}{dz} = R_p$$

4) Page 694, Equation (30) should read:

$$\rho_o C_p V_o \frac{dT}{dz} = - \Delta H_r R_p - \frac{4.364 k}{R^2} (T - T_w)$$

5) Page 694, Under heading "Molecular Weight Calculation"

$$\overline{X}_{mi} = (\overline{X}_{m,i+1} - X_{m,i}) = R_p \Delta z / (V_z C_{mo})$$

6) Page 698, Definition of gas constant to be consistent with numbers for activation energy should read:

$$R = \text{gas constant, } 1.987 \times 10^{-3} \text{ Kcal/g-mole-°K}$$

"Corotational Rheological Models and the Goddard Expansion," by R. B. Bird, O. Hassager, and S. I. Abdel-Khalik, *AIChE J.* ERRATA, *21,* 1237 (1975), should read [*20,* 1041-1066 (1974).]

In the Table of Contents *AIChE J.* *21,* 6, (1975). "Benzoin and Benzoin Methyl Ether-Sensitized Photopolymerization of Styrene and Methyl Methacrylate: Quantum Yields and Mixing Effects" should read "by S. K. Mendiratta, R. M. Felder and F. B. Hill."

(Continued on page 207)

(5) We suggest that there is no serious error in the calculation procedure for estimating dn/dc. The only assumption made which is of fundamental relevance to the published results is the existence of a linear relationship between n and c. This seems totally reasonable at the concentration levels used in the study. The assumption of "infinite length" is made reasonable by the observation that the solute has not reached the outer boundary of either phase during the period of the experiments. See, particularly, Figure 7. Finally, the fact that experimental values for the diffusion coefficient obtained using the centrifuge check reasonably well with those reported in the literature from other more classical studies seems clearly to indicate the absence of a "sedimentation effect" . . . . at least within the limits of these results. "Sedimentation" must thus be considered negligible by comparison with diffusion.

It seems worth repeating that the credibility of our results rests on the photographic evidence which provide the basis for the observations made. We acknowledge that some results seem at variance with ideas commonly accepted in the literature of interfacial mass transfer. We would be pleased to see our work repeated and comparisons made.

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Reply submitted by H. E. Hoelscher for both authors.

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Chandrasekhar, S. and H. E. Hoelscher, "Mass Transfer Studies Across Liquid/Liquid Interfaces", *A.I.Ch.E. J.*, **21**, 103 (1975).

Crank, J., "The Mathematics of Diffusion", Oxford Univ. Press, London, 1956.

TO THE EDITOR:

In a recent R. & D. Note, "The Functionally Near-Equivalency of Reynolds and Grashof Numbers, *AIChE Journal*, **21** (3), 609-610 (1975) Niels Madsen suggests that the Reynolds number and the square root of the Grashof number are nearly functionally equivalent. He further suggests that vectorial addition of Re and Gr' may provide a way of predicting mixed free and forced convection. This near-equivalence was first suggested by Krischer and Loos (1958) and later by Tsubouchi and Sato (1960). The latter authors and Börner (1965) tried to use vectorial addition in correlating their mixed convection data with poor results in opposing flow. Much evidence is now available from which it can be concluded that vectorial addition is unsatisfactory, e.g. the theoretical studies of Sparrow *et al.* (1959) and Merkin (1969) and the experimental work of Garner and Hoffmann (1961), Pei (1965), Narasimhan and Gauvin (1967) and Wilhelm (1971). It is also clear from flow visualization studies (Börner, 1965; Wilhelm, 1969) that the postulate of vectorial addition gives no insight into the complex flow patterns in mixed convection. Additional effort should be directed to furthering our basic understanding of mixed flows rather than along the lines suggested in Madsen's note.

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Narasimhan, C. and W. H. Gauvin, "Heat and Mass Transfer to Spheres in High Temperature Surroundings," *Can. J. Chem. Eng.*, **45**, 181 (1967).

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Sparrow, E. M., R. Eichorn and J. L. Gregg, "Combined Forced and Free Convection in a Boundary Layer Flow," *Phys. Fluids*, **2**, 319 (1959).

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TO THE EDITOR:

The remarks above concerning my *R&D Note* focuses attention on the past effort that has been expended by many investigators on the problem of mixed convection, either theoretical (boundary-layer analysis) or empirical (data correlation). My approach was limited to dimensional analysis supported by experimental data from the literature. In an earlier paper Lemlich and Hoke treated the same problem with a somewhat similar result and introduced the concept of an "equivalent velocity" for natural convection heat transfer. To summarize: (1) In my note the "equivalent velocity" is equal to $(\Delta t \beta g L)^{1/2}$ and it is shown on Fig. 1 that using this velocity, in the usual expressions for the heat-transfer coefficient for air in cross flow over a horizontal cylinder, yields nearly the same results for both natural and forced convection. In this connection, the figure, Fig. 1, should have been labeled $\log_{10} \overline{Nu}$ vs $\log_{10} (Re \cdot Pr^{1/2})$. 2) The dimensionless ratio Gr/Re^2 used by Tanaev (1956), Acrivos (1958) and Sparrow *et al.* (1959) is basically the square of the dimensionless ratio "effective velocity" over the forced velocity.

In conclusion, the "effective velocity" is a useful parameter in the theoretical analysis of natural and mixed natural and forced convection, but the literature cited by Weber indicates that simple vector addition appear not generally to be an adequate treatment of the mixed heat transfer problem.

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Tanaev, A. A., "Effect of Free Convection on the Coefficient of Resistance of a Plate with a Laminar Flow Regime in the Boundary Layer," *Sov. Phys.—Tech. Phys.*, **1**, 2477 (1956).

ERRATA

(Continued from page 203)

In the paper "Extensional Viscosity and Recoil in Highly Dilute Polymer Solutions" by Chander Balakrishnan and R. J. Gordon, 21, 1225 (1975), the word "left" in the caption to Fig. 1 should be changed to "right."