

continuous two phase mass transfer processes are subsequently discussed. The book ends with a well written chapter on the basic methods in analog computing.

One of the useful features of the book is that it is fairly self-contained in a sense that after formulating a problem in mass transport phenomena, the pertinent mathematical tools are immediately introduced, which may be either analytical (such as Laplace transforms) or may involve numerical methods which in turn may involve machine computation. Actual computer programmes have been included for some problems. Another good feature is an extensive list of unsolved problems with occasional useful hints. A welcome effort has also been made to introduce the reader briefly to some advanced topics in the field.

The book is not completely without errors or ambiguous statements. For example, on p. 265, the volumetric flow rate should have been calculated on the basis of v_{ave} rather than v_{max} , although the final result appears to be in the correct form. On p. 266, short contact times for mass transfer are wrongly identified with large Reynolds number. Some self-contradictory statements appear in the same paragraph on p. 266. The asymptotic penetration theory solution is first recommended for $Re > 100$, whereas later on it is recommended for non-rippling conditions, the latter corresponding to $Re < 25$. Some minor typographical errors creep in occasionally. However, these are easily rectifiable minor comments.

The author is to be congratulated on producing an attractive and well-written book. We strongly recommend the book to undergraduate students.

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F. J. BAYLEY, J. M. OWEN and A. B. TURNER, *Heat Transfer*.
Published by Nelson. £4.95, 438 pp.

THIS work is quite traditional in organization and also largely so in coverage. It is a first-level textbook. An introduction is followed by three chapters on conduction, three on convection, brief ones on radiation and change of phase and a concluding chapter concerning heat exchangers. The mood is pragmatic, both in the brief development of basic

conservation equations and in a strong emphasis on practical results. Each chapter has a supply of problems, often quite abstract, but frequently drawn from practical applications.

In conduction, the unusual steady state cases are given, followed by a detailed treatment of finite difference methods. After a brief treatment of transients, a several page introduction to finite element analysis is given.

Convection is introduced through a motivated writing of the continuity, Navier-Stokes and energy equations, in differential form. They are generalized for the results of similarity, described in terms of turbulence parameters and reduced to boundary layer form. The commonly cited boundary layer solutions, along with the laminar-turbulent analogy, occupy the following chapter.

Then a short presentation of engineering correlations is followed by a relatively long and detailed application of numerical methods to boundary layers. This information is welcome. However, it is of surprising detail, compared to the usual level of the book's penetration into current topics.

The brief chapter on radiation is disappointing. The usual classical quantifications of the behaviour of surfaces and of gases are followed by only four pages telling how to do other than the most reductive problems. Even this material is the form of the out-dated electric analogy and is in too brief a form to be readily useful to the student either in understanding radiant exchange or in gaining confidence by doing problems having a semblance of realism. Most books do much better than this.

Boiling and condensation receive brief and mainly descriptive treatment. This material is probably adequate to meet the attention these matters usually receive. The treatment of heat exchangers is very brief but, I think, conceptually quite clear and adequate. The writers introduce the simpler "effectiveness" idea very well. The appendix on properties seems adequate to the needs of the book and will perhaps retain some reference value for its users.

In balance, the presentation is clear and it should be a good teaching tool. It will require occasional amplification by those teachers who seek to motivate by bringing students to the level of solving somewhat diverse and realistic problems.

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