performance...". True: but there *could* be; for methods now exist for solving simultaneously the equations governing the linked motion of the two phases, and so of predicting the influence of plate geometry on performance. Such methods are especially economical when the flow fields are two-dimensional, as in the present case. Perhaps, somewhere, mathematical modellers are applying modern numerical methods of two-phase flow analysis to turbines and separators; but, if so, they are not given prominence in the present book. Heat-transfer specialists, who now use numerical methods more extensively, may like to give the matter some attention.

D. B. SPALDING

K. R. CRAMER and S. I. PAI, **Magnetofluid Dynamics for Engineers and Applied Physicists.** McGraw-Hill, New York (1973) 350 pp.

THIS book evolved from class notes presented to graduate students in the Mechanical Engineering and Physics Departments of the USAF Institute of Technology. The authors' intention is to prepare the advanced student for professional activity in the field of magnetofluid dynamics. The subject matter is approached from the continuum viewpoint, and includes material on viscous flows and wave phenomena.

The fact that rates of heat transfer may be influenced by magnetic fields is mentioned in several contexts; for example, in the use of a magnetic field to reduce the heat transfer at the surface of a blunt body moving at hypersonic speed. The final chapter, which deals with several advanced topics, introduces the theory of radiative transfer, and gives an example of thermal radiation effects on a magnetogas-dynamic flow. The best and most interesting sections concern engineering applications; notable amongst these are the magnetofluid-dynamic submarine and aerofoil.

All the important non-dimensional magnetofluid-dynamic parameters are introduced and discussed in the first chapter; these parameters are later used to specify the complete m.f.d. equations in non-dimensionalized form. The particular forms taken by these equations under several types of simplifying circumstances, for example the ideal plasma approximation, are given explicitly.

The clarity and usefulness of the book suffers from the inclusion of too much material in too little space. The authors spend only sixty pages presenting the fundamentals of electromagnetism and fluid mechanics, starting from Coulomb's inverse square law, and ending with the general magnetofluid-dynamic equations. As a result the more demanding topics, such as magnetostatic energy relations and the rate-of-strain tensor of a Newtonian fluid, are treated poorly. The authors have adopted this approach, i.e. of including basic material, because in their experience students are often inadequately prepared in either electromagnetism or fluid mechanics; but this book will do little to remedy this situation.

No account is given of turbulence, nor is reference made to numerical solution methods; these are serious omissions in a book designed for future engineers and applied physicists.

The advanced student may not find this book useful as a text book; for too little verbal explanation is given of the underlying physics. However, he will find it of use for reference material.

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