REVIEWS

Tables for the Compressible Flow of Dry Air. By E. L. HOUGHTON and A. E. BROCK. London: Edward Arnold, 1961. 64 pp. 12*s*. 6*d*.

This book gives tables for solving five problems concerning the flow of dry air. The air is assumed to be a perfect gas with $\gamma = 1{\cdot}403$ and $c_v = 0{\cdot}1715$. The problems are as follows: (1) isentropic flow with Prandtl–Meyer expansion angles; (2) frictionless flow in a constant-area duct with heat transfer; (3) adiabatic flow in a constant-area duct with surface friction; (4) normal shock waves; (5) oblique shock waves. In the first four cases the usual functions are tabulated against Mach number at intervals of 0·01 up to 4. For oblique shock waves the usual functions are tabulated against deflexion angle at intervals of 2°. This is done for both the strong and weak shock solutions and for inlet Mach numbers up to 4 in steps of 0·05. The coverage of the tables is therefore very satisfactory. The book also includes a brief but complete presentation of the theory of these flows.

This book will fill a need in the teaching of gas dynamics to engineers. The formulae involved are sufficiently complicated to make numerical evaluation laborious for the student; and in order to allow him to concentrate on the fundamental behaviour of the flows, and to work out a reasonable number of numerical problems, it is necessary to provide him with tables. Apart from the tables by H. W. Emmons (*Gas Dynamics Tables for Air*, Dover, 1947) which only cover the flows numbered 1 and 4 above, the only tables already available are comprehensive and expensive sets such as those by Keenan & Kaye (*Gas Tables*, Wiley, 1948) and the tables prepared for the Aeronautical Research Council (*Compressible Airflow Tables*, Oxford, 1952). At a price which puts it well within the reach of students, the present volume is entirely suitable for teaching purposes.

The book will also be useful for practical engineering purposes, particularly for the flows numbered 1, 4 and 5 above. The perfect gas approximation is satisfactory at ordinary temperatures, though for accurate work at high temperatures it is necessary to go to semiperfect gas theory. The flows numbered 2 and 3 are, as is pointed out, highly idealized and should be treated with due caution. They can, however, shed valuable light on certain practical problems relating to, for instance, combustion, detonation waves, and flow in seals.

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