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REVIEWS

Pressure Losses in Ducted Flows. By A. J. WARD-SMITH. Butterworth, 1971. 191 pp. £5.50.

This text is not as comprehensive as its title. It is a pity that in a text in which losses figure so prominently their origin is not clearly ascribed and related to thermodynamic irreversibilities.

In the section on "Turbulent Flow" (§ 1.6.3) the author appears to suggest that an adequate calculation procedure for turbulent boundary-layer flows will enable interference effects between components to be accommodated. Surely the elliptic nature of more complete describing equations must figure in any even semi-theoretical approach to such effects.

Incompressible flow in bends is treated in Part 2 in a way which is in general common to the remaining parts. The problem is clearly set out, experimental data thoroughly surveyed and added to, and finally a theoretical treatment of some aspects of the problem is developed.

Part 3 presents a one-dimensional analysis of the subsonic flow in straight or curved ducts of constant area. It differs from Shapiro's approach in allowing for arbitrary cross-sectional shape, axial variations of the centre-line curvature, and flow non-uniformities at a section. The opportunity is taken here of defining a coherent set of mean flow variables, so necessary with any one-dimensionally related analysis. Unfortunately, a mean total pressure is not one of these variables and the author is content to remark that there is no common agreement on a definition. The designer will nevertheless have to use one!

The most difficult topic is dealt with in Part 4: "A Unified Treatment of the Flow and Pressure Drop Characteristics of Constrictions having Orifices with Square Edges". There is a good discussion of the physics of the flow combined with theoretical considerations which provide a framework for a more logical analysis of the existing data.

Overall this is a valuable, if restricted, treatment of pressure losses in some ducted flows, which justifies the publisher's claim that it will be equally useful to the design engineer and the research worker.

J. WEIR and J. L. LIVESEY

Internal Flow–a Guide to Losses in Pipe and Duct Systems. By D. S. MILLER. British Hydromechanics Research Association, 1971. 329 pp. £20.

This text contains a large amount of raw data on losses in pipe and duct systems. Part I consists of a review of existing information on losses in pipes, bends (both circular and rectangular), diffusers and tee junctions. Interaction correction factors are given for various bend–diffuser combinations together with losses across a wide range of valves. This part is completed by a discussion of miscellaneous components mainly of interest to designers of power-station cooling systems. The remaining parts present the results of a large experimental pro-

gramme at B.H.R.A. on most of the topics discussed in Part I and comparisons are made with existing data.

The information is primarily aimed at the design engineer and for this purpose an introduction is given for a sufficient understanding of the systems under discussion. Worked examples are freely provided.

Some topics receive sketchy treatment; for example, losses across woven, round wire screens. This is made worse by the extremely brief list of references on system losses in general. The authors seem unaware of the large amount of carefully analysed data contained in the data sheets of the Engineering Sciences Data Unit.

There is no discussion of true total pressure loss in diffusing flows nor of any definition of mean values, even though the importance of non-uniform entry flows is clearly appreciated. A large amount of space is wasted presenting results which display virtually non-existent variations with Reynolds number.

There is, nevertheless, much useful data on relatively complex flow systems which is not available elsewhere; anyone who desires a more basic treatment of pressure losses in ducted flows should refer to the previously reviewed book by A. J. Ward-Smith.

J. Weir and J. L. Livesey