

REVIEWS

An Introduction to Incompressible Flow Machines. By D. H. NORRIE.
Arnold, 1963. 150 pp. 20s.

New books in this rather neglected field are to be welcomed. Although steady progress has been made in the design and performance of pumps, turbines and fans, little of importance on the subject has appeared recently in English. Most of the best literature is in German and the arrival of Mr Norrie's book has not materially altered the situation, because, to be fair, its avowed aim is 'to give an understanding of the basic principles and not to present a designer's manual or an advanced specialized text'. It is, nevertheless, a useful introduction for university students, which has the advantage of brevity but also the associated danger of being superficial. The book provides a useful collection of existing ideas and information culled unashamedly from English language publications on the subject. It lays no great claim to originality, about one-quarter of the figures being taken with due acknowledgement from other books, but it will save students having to search through many books for the same information.

Although quite rightly the value of dimensional analysis is emphasized, no mention is made of its elegant use by such authors as Marcinowski and Cordier to plot the characteristics of all fluid machines on a common basis. In its commendable aim of brevity some sections may mislead students; for instance, the statement that 'The bubbles of air in the flow cause a reduction in efficiency in the same way as cavitation' is just not true.

Some might regard the 'flow work' derivation of Bernoulli's equation as lacking rigour. The chapter on cavitation does not discuss sufficiently the limitations of the Thoma sigma and the use of possible alternatives such as suction specific speed.

The relative eddy concept in radial-flow machines is rather outmoded and one would prefer to see reference to blade circulation and aerodynamic theory. Although generally well illustrated, a point which students will appreciate, figure 5.1 has no scales marked on it.

Velocity triangle notation is always a difficulty in this field, but the British system adopted, although logical, is probably the least used in world literature. American and continental data have more in common and the VDI has recently made strenuous and constructive attempts to standardize notation. The choice of ft.lbf/slug as the units for head, although logical in the author's system, may lead to unnecessary confusion among students in a world which generally uses ft.lbf/lb. weight.

However, despite such limitations, the book will be welcome to students because it is short and remarkably cheap.

S. P. HUTTON