REVIEWS

Vorlesungen über theoretische Gasdynamik. By J. ZIEREP. Karlsruhe:
G. Braun, 1962. 298 pp. DM. 42.

There is a set of circumstances which is especially conducive to the appearance
of a book like that under review: an enthusiastic incumbent of a new chair, a
large audience earnestly interested in a new course of lectures and willing to
submit to an exacting series of exercises, and a stimulating and critical colleague
who happens to be the editor of a series of books on fluid mechanics. Thus we
have a new book on theoretical gasdynamics, which is not meant to be a
treatise or a manual, but which makes these lectures available to a wider public.
It is quite evident that the lectures have been lively and informative; the
presence of inquiring engineers at its formulation can be sensed from the final
text, and some of the awkward questions engineers are apt to put to mathe-
maticians can almost be reconstructed from the answers.

The author's upbringing—he is a pupil of Haack and worked with Oswatitsch
for a number of years—is strongly evident in this book. Also evident is the
author's ambition to achieve a really systematic and tidy presentation of the
material, with the emphasis on methods and general principles. In this he suc-
ceeded, and he was helped, no doubt, by the selection of material he made:
gasdynamics is regarded as a series of examples of initial-value and boundary-
value problems governed by a set of conservation laws. This approach at once
indicates the strength and the limitations of this book and explains the list of
contents. Carefully worded chapters on the fundamental concepts and laws of
conservation are followed by chapters on wave propagation (first the linearized,
then the non-linear treatment), on steady flows in two dimensions, on flows past
bodies of revolution (always both linearized and non-linear), on aerofoil theory,
and on similarity laws. The material is taken almost exclusively from the class-
ical domain; real-gas effects are mentioned only occasionally and hypersonic
flows are largely those where $M\theta \approx 1$. The reader working on present-day
problems will therefore find little direct help, even though many of the examples
treated are meant to be of a practical nature. But then this is true of all books
on gasdynamics known to the reviewer. One feature of the book is that a good
deal of information is given in the form of exercises, for which answers are
supplied. This introduces a desirable element of variety without disturbing the
uniformity of presentation. What does not seem to have received the author's
generally painstaking attention are references to original papers and the index.

As the present volume is intended primarily to deal with the effects of com-
pressibility, a second volume is to follow, which is to be devoted to a considera-
tion of the effects of friction and heat transfer, to transonic and hypersonic
flows, and to magnetogasdynamics. One may expect that physical aspects will
then come more to the fore. Altogether, one can say of the present book what
the author often states with evident satisfaction on completing the successful
treatment of a problem: 'Das ist ein sehr einleuchtendes Ergebnis'.

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