an absorption line in working out oscillator strengths in quantum theory.

The correspondence between classical and quantum theory is the strongest thread running through the collection of papers, and it is sobering to see how much people were having to feel in the dark. The "Principle of Correspondence" was the biggest muddle, and one of the merits of this compilation (and van der Waerden's introduction) is that it shows how even Bohr tended to be inexplicit and even ambiguous in his statements about when quantum theory and classical theory would coincide—large quantum numbers or low transition frequencies ?—until van Vleck produced a paper in 1924, the outstanding merit of which was its superb clarity of exposition (*Phys. Rev.*, **24**, 330; 1924). If ever there has been a case for believing that the literature is really intended to change the way in which people think, this may be it.

The frequent repetition of that lesson is one of the most important virtues of this juxtaposition of documents now classical. Van der Waerden is quick to point out how much Heisenberg's first construction of matrix mechanics owed to what Kramers had already done with the dispersion relations and how much of the strength of the paper by Born, Heisenberg and Jordan (*Zeits. Phys.*, **35**, 557; 1926) stemmed from Born's feeling for the ins and outs of Hilbert spaces—which is why it is odd that they did not recognize that eigenfunctions must represent stationary states. Perhaps, after all, there was a grain of truth in Pauli's gibe about the addiction of the people at Gottingen to "tedious and complicated formalism". Certainly, his own much more down-to-earth calculation of the energy levels of the hydrogen atom has a cheerful directness which could not fail to be enormously stimulating.

All these undercurrents would have been easier to follow if van der Waerden's selection had been wider. Quite deliberately he has stuck to the mainstream of the succession from Planck to Dirac, and hopes to produce a second volume dealing with wave mechanics. But is it really sensible that Schrödinger should be mentioned only once or twice, in asides, and that the word "complementarity" should not appear at all ? The trouble, which assails all compilers, is, of course, that original papers take up an enormous amount of space. This collection is well justified by its inherent interest, and may help to stimulate a really well connected history. In the nature of things, it cannot be a substitute for it.

JOHN MADDOX

FLUID DYNAMICS

An Introduction to Magneto-Fluid Mechanics

By V. C. A. Ferraro and C. Plumpton. Second edition. Pp. 254. (Oxford: Clarendon Press; London: Oxford University Press, 1966.) Cloth 50*s*. net; paper 25*s*. net.

THIS, the second edition of a book which has been available since 1961, contains a considerable amount of new material as well as a change of emphasis in some of the earlier text. The authors intend it to be an introduction for research workers in magnetohydrodynamics and plasma physics and hope that it will be found suitable for third year undergraduates studying these topics. They succeed admirably. I have used the first edition in both of these contexts; the new edition is even better and the paperback version could be recommended as a "best buy" for a new student.

The work is that of those who have taught the subject as theoreticians, but behind the formal presentation the physical implications are always evident. Reference to experimental work remains almost non-existent, and a collection of experimental references relevant to each chapter would be most helpful. Unless a student is a dedicated theoretician much of this excellent text will not come to life until he relates it to experimental work. There is no lack of experimental evidence on many of the topics discussed here.

The book divides into two sections: magnetohydrodynamics, in which the electrically conducting fluid is treated as a continuum, and plasma dynamics, in which the particle description is dominant. The main aspects of these two approaches are covered in varying degrees of detail, and where they have made changes in this new edition the authors have recognized areas of interest which are likely to be important in the next few years.

J. PAIN

LECTURE NOTES

Notes on Thermodynamics and Statistics

By Enrico Fermi. Pp. viii + 182. (Chicago and London: The University of Chicago Press, 1966.) $4.50; 33*s*. 6*d*.

THIS book consists of a reproduction of the lecture notes which Fermi used in his 1951–52 course on thermodynamics and statistical mechanics. The notes are, as one should expect, very condensed, being mostly composed of mathematics with occasional sentences linking it up. The course is quite conventional and the book could well be used by someone lecturing in this field, and also by students taking such work. Fermi's other lecture notes which have been published already have been used to a surprising extent in lieu of regular text-books. But their main interest is to see into the mind of a great scientist a little further than usual, to see which points he thought worth writing out in detail, and which were classified as "résumé". Interesting also for us to see that Fermi–Dirac statistics are just "Fermi Statistics", but the Thomas Fermi atom is "the statistical atom".

I expect most people who lecture in this area would like to write notes as clear and as cogent as these, and also apparently write effortlessly (because there was no thought of publication in Fermi's mind); let alone to use one's own name on a major section.

S. F. EDWARDS

PUBLISHING PLASMA PHYSICS

Journal of Plasma Physics

Vol. 1, Part 1 (February 1967). Pp. 156. Published quarterly. Annual subscription: 140*s*. net; separate parts, 50*s*. net. (London: Cambridge University Press, 1967.)

THE past ten years have seen the arrival of plasma physics as a fashionable subject. The initial impetus was given by the promise of thermonuclear fusion, and the momentum is being maintained by the current space research programme. Plasma as the fourth state of matter occupies 99 per cent of the volume of space known to man. Its study embraces disciplines which, even now, are widely separated in undergraduate courses. The modern aeronautical engineer must solve problems in non-classical flows of very low number density, and the geophysicist seeking the origins of the Earth's magnetic field will have much in common with the engineer designing a hydromagnetic pump. Astronomers, astrophysicists, laboratory spectroscopists and specialists in electromagnetic theory overlap in their common interests in the behaviour of plasma. Even solid state scientists have plasma problems. The rapid growth of publications from so many sources has meant that the early work found its way into a large number of journals, but this situation has been rationalized to some extent in the past few years and the process is continuing. In this context the appearance of this now quarterly journal must be welcomed as a step in the right direction.

The *Journal of Plasma Physics* obviously derives from the *Journal of Fluid Mechanics*, which has increasingly carried papers on the fluid behaviour of plasma. The style and typography of the two journals are very similar.

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