Books

Theoretical and Experimental Aspects of Controlled Nuclear Fusion, Vol. 31 (390 pp.) & **Controlled Fusion Devices,** Vol. 32 (463 pp.) of Proc. of 2nd UN Internat'l Conf. on the Peaceful Uses of Atomic Energy (Geneva, Sept. 1958). United Nations, Geneva & New York, 1958. $15.00 each. **Controlled Thermonuclear Conference** (Washington, D. C., Feb. 1958). 536 pp. (AEC) Office of Technical Services, Dept. of Commerce, Washington, D. C., 1958. Paperbound $4.75. *Reviewed by D. J. Rose, Massachusetts Institute of Technology.*

SOME time ago, I observed the appearance of *An Annotated Collection of Mongolian Riddles.*[1] Presumably answers were supplied, an advantage not shared by some contributions to the volumes under review. What does a reviewer say about such books? He cannot make occasion to needle the author, nor even propagate his own views, which by inference are superior to those in the book. These volumes, being collections of papers dumped into the laps of program committees, are for experts in the field almost exclusively. But the expert already has a fair idea of what is in them, and has purchased them if his need is great enough. If anyone be still undecided, I address my remarks to him.

The Washington Conference Report (for short) is paperbacked, but pretty well bound nonetheless. It lists 87 titles of papers. From this one subtracts 11 papers for which no text was available, about 20 which are abstracts only or impossibly brief, and a dozen more that have no apparent useful content. Incidentally, about thirty of the listed titles refer to work also discussed in the Geneva Conference volumes. A few are identical; one can sometimes get considerable mileage per paper on a clear day. All in all, considering that the substance of a further number of papers can now also be found in the standard literature, there remain only about 30 not conveniently found elsewhere. The nature of these is such that the book should be available in the library, but generally not on anyone's desk.

The Geneva Conference volumes are a somewhat different matter. The two volumes contain 110 papers on fusion topics, and both should be considered together. To be sure, most of the theory is in Volume 31, and most of the diagnostics is in Volume 32; the remainder of the papers, despite the titles listed for the volumes and the sessions recorded therein, are not sharply divided. This reflects the fact that a "controlled fusion device" is really an "experiment". While a number of these papers are also finding their way into the standard literature, one would search a long time to compile an equivalent set. Everyone put his best foot forward for the conference, so the world-wide state of the art is well sampled. A few papers are patently ridiculous, and some are mysterious (if not inscrutable), but most are very acceptable. Personal experience shows that samples from this collection, augmented with some basic theory and ancillary facts, will make a satisfactory graduate course in thermonuclear processes. The volumes are highly recommended to all who teach the subject.

They serve as an excellent record of thoughts on controlled fusion up to 1958, and it will be interesting to look back in later years upon our current naïveté. Even now, it is both amusing and salutory to consider the optimism of five years ago, before some of the difficulties became apparent.

One can make some general observations from the Geneva volumes: there are several excellent reviews (Artsimovich, for example); the USSR has better papers on some phases of plasma theory; the USA has generally better large devices; a disturbing fraction of the large devices are turning out to have their theoretical foundation built upon the sand; there is probably a lot more theoretical sand, which hasn't been found yet; there is a need (attempts are being made) to unify the various approaches to the theory, so that more common meeting ground can be discovered; some of the most significant advances come from projects of modest size, well thought out; the various groups working on separate ideas (even in the same country) don't talk to each other often enough; security has held back the program.

[1] Amer. Phil. Soc. Trans. **44**, Part 3 (1954).

Liquid Helium. K. R. Atkins. 312 pp. Cambridge U. Press, New York, 1959. $11.00. *Reviewed by A. Maradudin, Institute for Fluid Dynamics and Applied Mathematics, University of Maryland.*

THE appearance of a new book on liquid helium, only the second to have been written about the subject in the fifty-one years since Kammerlingh Onnes succeeded in liquefying helium, and the first new one since Keesom's *Helium* was published seventeen years ago, must be considered an event. It also prompts one to make the inevitable comparison with Keesom's compendium of the nature and properties of helium in all its forms. Both books are exhaustive surveys of the theoretical and experimental knowledge of their subject at the time they were written. The resemblance pretty well stops here. While Keesom discussed the properties of helium gas, solid helium, the helium atom, and the helium nucleus, in addition to the properties of liquid helium, Atkins confines himself to the latter topic exclusively. Furthermore, considerable progress has been made in the field since 1942. At that time the two-fluid theory was only two years old. Landau's