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Properties of Materials at Low Temperatures (Phase I)

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the answer here. The navigator, who uses a different nautical almanac, will have somewhat less use for this *Supplement*, especially if his mathematical background is insufficient to permit reading all of it. However, anyone interested in practical astronomy, either professionally or as an amateur, will certainly want this *Supplement* in his personal library.

Progress in International Research on Thermodynamic and Transport Properties. Symp. Proc. (Princeton, Jan. 1962). Joseph F. Masi and Donald H. Tsai, eds. 762 pp. American Society of Mechanical Engineers and Academic Press Inc., New York, 1962. $24.00. *Reviewed by Stuart A. Rice, University of Chicago.*

THIS collection of papers contains useful information for those investigators interested in thermodynamics and transport properties. In particular, an extensive review by Liley provides 394 references to recent transport studies of liquids and gases. These are also cross referenced according to the appropriate transport coefficient. There are also contributions on the properties of ionized gases (unsophisticated), on the properties of non-Newtonian fluids, and a number of standard determinations of thermodynamic properties. On the whole the theoretical papers present reviews of recent work but do not in themselves present any new ideas. The theory of transport phenomena is adequately covered, including recent developments in the statistical theory and recent developments in curve fitting. At $24.00 the volume is too expensive for an individual investigator to have in a personal library but is a worthwhile investment for departmental libraries.

Properties of Materials at Low Temperatures (Phase I)—A Compendium. Victor J. Johnson, editor, 983 pp. Pergamon Press Inc., New York, 1961. $30. *Reviewed by Joseph Hilsenrath, National Bureau of Standards.*

IT would be unfair to the editor and contributing authors to proceed to review this compendium without mentioning first the special situation which led to the preparation of this material originally as an Air Force technical report, and the general legal status of material in the public domain, which, judging from this publication at least, seems to leave an author or his agency no voice in deciding the time or the place or the format for the dissemination of his work in a formal publication.

To put the matter bluntly, this is an unsanctioned reprint of a technical report submitted under contract between the U. S. Air Force and the Cryogenic Engineering Laboratory of the Boulder Branch of the National Bureau of Standards. The three-part report was issued by the Wright Air Development Division as WADD Technical Report 60-56 entitled *A Compendium of the Properties of Materials at Low Temperature (Phase I)*. Copies of this report were printed and

distributed promptly in January 1961, to governmental and industrial groups directly interested in these data. Later in the year, these reports were released to the Office of Technical Services of the Department of Commerce by the Air Force in accordance with statutory requirements. The OTS advertised these reports in Vol. 35 #6 of U. S. Government Research Reports, dated June 16, 1961. These reports are still in print and will remain so until they have been superseded by more current or revised material, at which time they will be withdrawn from sale.

The reader is reminded that technical reports do not generally receive the careful editorial review or refereeing which is accorded to serial literature. Air Force reports are no exception. At best, they represent drafts of contemplated publications. And in any case, it is understood by most scientists and librarians that they are preliminary documents; that they may contain typographical and perhaps even more serious errors; that they are subject to revision, serious recasting, or even to outright withdrawal if the authors should so decide.

However, the technical report facilitates the exchange of information in urgent development programs and perhaps even in highly competitive research fields where priority is an important factor. But even in these fast moving fields, the technical report is no substitute for a publication in a reputable scientific journal or a well established, monograph series. To elevate a preliminary document such as this from the report literature to the status of a formal hard-covered compendium without the cooperation and collaboration of the authors is a disservice to the authors and to science itself.

This reviewer has been informed that the Pergamon decision to reprint this report was made without so much as a word to the editor, the contributing authors, or the governmental agencies involved, and that the NBS learned about the plan only from a news release carrying advance notice of the publication plan. Nor was the publisher deterred by NBS arguments presented in writing in May 1961. This correspondence stressed the unfinished character of the compendium, the intention of the authors to subject the material to a more critical analysis (a process in which, I am told, they are now engaged), and contained a clear statement of disapproval to reprinting the reports in their present condition.

A satisfactory reply to these points was never received nor were page proofs, tear sheets, or even a single bound copy. This is hardly an ideal relationship between a publisher and an author. Had this relationship been more normal the compendium under review might at least have contained a page or more of errata which are now in the editor's hands.

The above remarks should serve to set the stage for the comments to follow. This work, as well as the above-cited report, is a loose-leaf collection of charts, tables, and references on the properties of solid, liquid, and gaseous forms of helium, hydrogen, neon, nitrogen, oxygen, air, carbon monoxide, fluorine, argon, and methane. The properties which are presented at tem-

peratures below 300°K are: density, expansivity, thermal conductivity, specific heat, enthalpy, heats of transition, phase equilibria, dielectric constants, adsorption, surface tension, and viscosity where appropriate. A cross-referenced bibliography of 1068 references is included.

The charts, which are really the primary vehicle here for the presentation of the data, are well prepared and are probably useful to the design engineers for whom they were intended. The tables presented on the backs of these charts should, however, be used with caution. They should not be used as definitive values since they are not the result of the painstaking critical analysis required for such purposes. In this connection it should be mentioned that the words "selected values" or "best values" used in the introduction in describing the tabular material serve more as a description of the hope and intention of the authors than of an accomplished fact. To continue in this vein, however, would be to lose sight of the fact that this "formal publication" represents an abortive birth and should be treated accordingly.

Beyond these remarks, the reader is reminded that this $30 compendium is available in an equivalent or perhaps even better format for $13 (Part 1, PB 171618, $6.00; Part 2, PB 171619, $4.00; Part 3, PB 171620, $3.00) from the Office of Technical Services, Department of Commerce, Washington 25, D. C.

Non-Destructive Testing. By J. F. Hinsley. 495 pp. Macdonald & Evans Ltd, London, 1959. Distr. in US by Gordon & Breach, New York. $15.50. *Reviewed by Walter G. Mayer, Michigan State University.*

THE subject of nondestructive testing is presented in such a manner that the uninformed reader will have no difficulty in understanding this lengthy review of well-known methods while the more expert reader may occasionally become a little impatient.

The first fifty pages deal with definitions, general descriptions of the merits of nondestructive testing, and related preliminaries. This is followed by an extensive résumé of x-ray techniques and radiological methods, complete with historical sketches. Less extensive chapters on ultrasonic and magnetic flaw detection are followed by short discussions of other rather well-known techniques. Various procedures are outlined for the actual performance of specific tests with the emphasis on radiological techniques. The book also contains short chapters on mathematical principles and certain safety precautions.

The book is well illustrated although many pictures of assorted hardware do not seem to contribute too much to the understanding of the subject matter. It is perhaps not surprising that much space is devoted to radiological techniques: the author is chief radiologist and physicist with a British industrial concern. His position may possibly account for the fact that—in comparison with the other chapters of the book—the author presents the sections on radiology with authority obviously based on experience.