already experienced in the field. If the task is approached in an earnest and disciplined manner, the eventual result is a large collection of notes, diagrams, tables of data, and it is hoped, some synthesis of these into a set of original ideas.

If one has invested enough time and effort in such a project and has been supported by funds not his own, the natural consequence is that there is strong pressure from one quarter or another to publish the results of these efforts in order to justify the time spent. The materials are thus organized into a form which it is hoped resembles a book and thence turned over to a good editor for criticism and honing prior to publication. This book by Carl. W. Hall is apparently the result of the sequence of events given above without the benign intervention of the specified competent editor.

It is difficult to decide exactly what audience this book is designed to serve. The best guess, based upon the book's rather rudimentary text, would be that of generalists, such as administrators and policy-makers, or interested non-professionals. Perhaps it is also meant as a reference source for beginners, because of its 267 pages some 53 pages are taken up in glossary, list of acronyms, and conversion tables, and over 80 more pages are given over to summary tables and diagrams, some of which are useful in spite of the large number of obvious typos and not-so-obvious omissions and inaccuracies. Forty more pages comprise the literature cited. We are thus left with fewer than one hundred pages of text, which would be adequate to summarize the subject at the level chosen except for the fact that organization and flow of logic are nonexistent, making reading and comprehension of what is said a heavy task indeed. This is the first major flaw. The second is that there is, unforgivably, no index and only a very skimpy table of contents. Hence, in a book which could be useful as a source of quick reference, one is reduced to thumbing through the pages in order to find needed information.

We must assume that the writer had a sincere desire to inform. The book, if properly edited and organized, would have accomplished that end in that it contains a considerable amount of useful information, and while already somewhat outdated, touches upon the major areas of thought and much of the body of working data related to biomass utilization. Clearly, someone has slipped badly in letting this work through in its present form.

Reviewed by:
H. W. Scheld
Department of Biology
University of Houston
Houston, Texas 77004

Solar Heat Storage: Latent Heat Materials, Vol. I: Background and Scientific Principles, by George A. Lane, CRC Press, Boca Raton, Fla., 1983, 238 pages, $76.00

This book fills a longstanding need for a reference source on the rapidly increasing field of latent heat storage technology. Its arrival is particularly welcome because it has overcome the polarization that exists between scientists working on different aspects of latent heat storage. Both the authors (Chapter 5 was written by R. Viskanta) have been active researchers in the field over the years past and are eminently qualified to write about it. The book is lucidly written in a scholarly style, and this reviewer recommends that a niche be found for it on the shelves of every worker in the field.

The first chapters, written by Lane, cover the history and the thermochemical scientific background underlying latent heat storage. The final chapter, by Viskanta, rounds out the volume with a review of heat transfer in freezing and melting processes. All the chapters have extensive lists of references and a detailed subject index is provided, which further enhances the value of the book.

Chapter 1 gives an introduction to the problem of heat storage and various ways of storing heat and concludes with a very interesting account of the history of latent heat storage. Any newcomer to the field will benefit by making himself aware of the fate of those who tangled with Glauber's salt. Chapter 2 gives, along with a brief review of the desirable properties of a latent heat storage material, a list of materials for low temperatures ($<100°C$) and shows how to estimate heat capacities when data are not available. The next chapter provides a compact but comprehensive summary of phase-equilibrium in unary, binary, and ternary systems. Chapter 4 covers crystallization, supercooling, and nucleation promoters. Chapters 3 and 4, written from the point of view of a chemist, provide the basic understanding necessary for making an intelligent selection of storage materials.

Heat transfer during melting and freezing is treated in the final chapter. These topics are somewhat younger and have many unanswered questions, and the chapter presents the current state of knowledge of the subject. Anyone thinking of using the analytical results provided there is cautioned to check the equations by looking up their sources and to be critical in accepting the descriptions of various solutions. For example, the "exact solution" for freezing with constant wall flux (p. 168) is false. Also lacking is a table of transport properties for common latent heat storage materials. Some results are given in dimensional form and are unusable because the experimental parameters pertaining to them are not given. On the plus side, the chapter gives many new correlations for heat transfer during melting. It is hoped that the existing shortcomings will be eliminated in a subsequent printing. On the whole, this chapter provides much useful background information for sizing heat exchangers for latent heat storage.

We shall look forward to the publication of Volume II, *Technology and Applications*, which, we are told, is being written.

Reviewed by:
N. Shamsundar
Department of Mechanical Engineering
University of Houston
Houston, Texas 77004

Solar Retrofit: Adding Solar To Your Home, by D. K. Reif, Brick House Publishing Co., Andover, Mass., 199 pages, $11.95

Passive Solar Energy: The Homeowners Guide To Natural Heating and Cooling, by B. Anderson and M. Wells, Brick House Publishing Co., Andover, Mass., 195 pages, $10.95

The Solar Decision Book of Homes: A Guide to Designing and Remodeling for Solar Heating, by R. H. Montgomery with W. F. Miles, John Wiley & Sons, New York, 331 pages, $15.95

The solar energy literature is unique from other technical areas in that it contains a body of information which is directed at specific, nontechnical groups. This part of the literature often contains, at its best, a specific philosophy, and at its worst, conviction bordering on religious zeal. These three books represent the best of this literature. While they will be of little use in helping the solar engineer to understand basic principles or to design systems which will meet specific

[3] Kelly R. Latent Heat Storage in: Building Materials. Building Services Engineering Diploma Dissertation, Dublin Institute of Technology, Bolton Street (1999). [4] Lane G A: Solar Heat Storage: Latent Heat Material, Vol. I, Background and Scientific Principles. Florida, CRC Press Inc, (1983). [5] Zhang Dong, Zhou Jianmin and Wu Keru: Energy Conservation and Environmental Protection Vol. 1 (2004), p.17. Cited by. Related Articles. Solar heat storage: latent heat material, vol. I: background and scientific principles. Jan 1983. Ga Lane. Lane GA. Solar heat storage: latent heat material, vol. I: background and scientific principles. Florida: CRC Press; 1983. Effect of water flow on PV module: A case study.Â This paper reviews various Phase Change Materials (PCM) in solar thermal energy storage systems for various types' viz. sensible heat storage, latent heat storage and thermo-chemical storage etc. The details of various Phase Change Materials, their properties and characteristics are studied and analyzed. @article{osti_6972497, title = {Solar heat storage: Latent heat materials. Volume II. Technology}, author = {Lane, G.A.}, abstractNote = {This volume focuses on perfecting and using phase-change materials (PCMs), developing and testing practical encapsulated PCM forms, and designing heating and cooling systems which use PCMs: Extensive descriptive material and available physicochemical data are given on a number of commercial and development PCMs.Â This work provides background information and scientific fundamentals necessary for understanding and applying solar heat storage principles. The physical, chemical, and thermal properties, safety and toxicity, and economics of latent heat storage materials are discussed.