

containers, a double lobed tank, a hemispherical shell filled with liquid oxygen, and a spherical shell. In all cases, the results are shown to be in satisfactory agreement with exact solutions or experimental data. Finally, a BE formulation for the water impact problem developed by Geers *et al.* is presented. In this problem several formulations such as the MAC method and the FE method are available, and it is a pity that the author has not established conclusively his expectation that the BEM offers the opportunity to perform computations at reasonable cost, by comparing the CPU time requirements for these methods.

The last chapter, Chapter 8, is devoted to an application of BEM to viscoplasticity and creep. Three examples are considered: a simple supported deep beam under uniform load; a thin disc with a central rigid insert under constant external edge load; and a rectangular plate bonded on one edge to a rigid support and subjected to a sudden uniform temperature drop. The last example is particularly interesting since it demonstrates quantitatively that the BE results were obtained at less than half the CPU time required by a corresponding FE solution.

The text design quality is good and the book is very well printed and illustrated. The Editor did well to invite and collate all this interesting material in a single, handsome volume. The reviewer feels, however, that with slightly more editorial effort the styles of the presentations could have come closer together. Some inconsistencies and a certain incompleteness, as afore-mentioned, could have been eliminated and the book could have been a milestone in the development of the BEM. These small criticisms aside, the book can be thoroughly recommended to researchers in this field and to any practising engineer who is looking for new methods in solving his problems.

N. C. MARKATOS

*Faculty of Science & Mathematics  
School of Mathematics, Statistics  
and Computing*

*Thames Polytechnic, London SE18 6PF, U.K.*

M. S. SODHA, S. S. MATHUR and M. A. S. MALIK,  
**Reviews of Renewable Energy Resources.** Vol. 1,  
Wiley Eastern Lim., New Delhi, 1983, 368 pp.

THIS is the first volume of a series, an effort supported by the UN University Fellowship Programme at the Centre of Energy Studies, Indian Institute of Technology (IITD) Delhi. This volume, as well as the announced second volume only deals with subjects related to thermal solar energy. Other renewables like wind energy are not (yet?) covered.

The five reviews in this volume compromise topics on work done at IITD, often in cooperation with other countries. This means that on the one hand specific details of systems are related to those developed in India, on the other hand the references give a very complete coverage of the literature of a particular topic.

The first review covers plastic solar collectors. This is quite appropriate because from a cost point of view they are attractive for developing, but also for developed, countries, the authors mention lifetime expectations of 1–9 years compared to 3–15 years for conventional collectors. Both for water and air heating collectors much information has been given. The second review discusses solar collectors with integrated storage systems. Again attractive for developing countries because of the simplicity of the system. Solar ponds, shallow water systems and collector-cum-ground storage units are discussed and the thermal system design given. The discussion of solar ponds is restricted compared to the other examples.

Solar hot water systems and their thermal modelling are given in a separate review. From basic radiation and heat

transfer considerations as generally only found in textbooks, flat plate collector performance is derived. The practical applications considered are IITD systems and their performance. However, the equations have a general character and can be adapted for use in other systems.

Also solar absorption refrigeration and space conditioning are discussed. Only the ammonia–water cycle has been considered. This is surprising, because at the end of the review it is concluded that a single stage refrigeration cycle of this kind gives too low a C.O.P. for solar applications.

One wonders why the lithium-bromide cycle, which is much more attractive for solar air-conditioning, has not been discussed. The paper emphasizes the use of the ammonia–water cycle with the generator heated with solar energy as a heat pump for space heating.

However, much detailed information and many references are given on the thermodynamics and simulation of these systems, but few technical details on flows and conditions in an actual unit. The energy storage aspect is well covered and shown to be important.

Solar distillation is covered in the last review. Simple solar stills are reviewed. It is however, surprising that with the emphasis on topics related to developing countries this review is the shortest of the five. Especially so because the authors claim that this solar application is one of the most attractive on account of the fact that many tropical countries are in need of potable water. However, as a first introduction, with again a rather complete set of literature references this chapter will serve its purpose.

For this reviewer a drawback of many review books is that the topics covered are rather mixed and one's particular interest may go to only one or two of the topics covered. For those cases this volume gives a good review of the state of the art and refers rather completely to original papers. For a more general purpose in education the diversity of topics covered could restrict its use. For research and development institutes and groups working on thermal solar energy these reviews give important and useful information.

C. J. HOOGENDOORN

*Technische Hogeschool Delft  
Laboratorium voor Technische Natuurkunde  
Postbus 5046  
2600 GA  
Delft  
The Netherlands*

J. TABOREK, G. F. HEWITT and N. AFGAN, **Heat Exchangers: Theory and Practice.** Hemisphere, Washington, DC, 1983, 992 pp., \$69.96.

THIS is a bound volume of eleven invited lectures and 30 papers by some 80 authors, selected from 70 papers presented at the 1981 Seminar of the International Centre for Heat and Mass Transfer. It is hardly, as the title suggests, a book on the subject.

The notice inside the paper cover says it is "an authoritative volume providing up-to-date information on the complete spectrum of heat exchanger application in industry" which is rather too much for the editors to claim. The up-to-datedness is not in question, but the volume is largely uncoordinated and is far from a complete 'spectrum' whatever the word means. The papers frequently lack comparisons with other published data, for example, on the widely important subjects of heat transfer and pressure drop in tube bundles the four papers, two from U.S.S.R. and two from Germany, refer scantily to other work; one paper has no references.

In these respects, the volume cannot be compared with the recent *Heat Exchanger Design Handbook* also published by Hemisphere, which is a more comprehensive, logically set out account of the subject.