The book will be of value to all who are interested in what is presently being done in this area of research. Owing to the large number of invited papers (25), which have more of a review nature, the book will also be of some interest to non-specialists and students.

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Physics and mechanics of ice. (International Union of Theoretical & Applied Mechanics Symposium, Copenhagen, 1979.) Edited by P. TRYDE. Pp. xiv + 378. Berlin: Springer-Verlag, 1980. Price DM 74.00, US $43.70.

Ocean engineering has advanced rapidly in the last two decades, and in high latitudes, where the floating ice cover is generally a major hazard, extensive investigation and detailed analysis have cleverly turned the sea ice to advantage as loading and drilling platforms. This collection of papers, focused on big-scale ice engineering, is a reference text.

The mathematical and physical modelling cannot be spelled out in limited length papers, so some are rather difficult to comprehend, but the problems tackled range from crystal boundary cracking in ice creep to the design of the Danish icebreaker. Better to understand some of the papers, the reader should begin with more comprehensive texts such as Patterson (1968), *The Physics of Glaciers*, or Hobbs (1973), *Ice Physics*. A paper by Mellor gives a scholarly synopsis of current knowledge of snow and ice and Assur discusses the state of the science and current problems, but 15 of the 25 papers concentrate upon extensive ice plates a few metres thick. Four are relevant to glaciers, three to ships in ice, one to iceberg dodging and one to ice as a support in rock wall mining.

Impurities, even in very low concentration, weaken fresh-water ice, but sodium salts have been found to strengthen the single ice crystal. Little of this is amplified in the papers and in some the type of ice considered is not detailed. Glaciologists have done little on ice flow at low stresses so some papers break new ground in this. Miller, and also Goodman, give results illuminating the recent material parameter of fracture toughness and the critical stress intensity required to propagate a crack, which is a function of the strain energy release rate. Most of the workers are in North America, but European and Japanese workers have contributed from laboratory and field observations. There is a summary, at the end, of questions and answers. The book is a healthy collection of views and aims in the applied science of ice, and the editor and organising committee are to be congratulated.

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Dislocations in solids. Vol. 1. The elastic theory. Edited by F. R. N. NABARRO. Pp. xx + 364. Amsterdam, New York, Oxford: North-Holland, 1979. Price Dfl 125.00, US$61.00.

This first volume of a set of five contains five totally independent articles, each with its own title, contents pages and list of references. Only the author and subject indexes and the editor's fifteen-line preface are shared by the various articles. This review is accordingly broken into sections, reflecting the very fragmented nature of the book.

The introduction by J. Friedel is well illustrated and non-mathematical. The treatment is nonetheless reasonably advanced, including some discussion of dislocations as solitons. The reference list is curiously (and unnecessarily) split into a list for section 1 and a list for the remaining sections.

A. M. Kosevich discusses crystal dislocations and the theory of elasticity in a useful, detailed discussion containing 281 equations: it is unfortunate that the addendum sections, dated 1976, could not have been inserted after the appropriate sections of each chapter, in view of the 1979 publication date.

J. W. Steeds and J. R. Willis very briefly discuss dislocations in anisotropic media: I found their table of analytic solutions, with examples of real crystals, rather interesting and worthy of extension.

J. D. Eshelby provides a useful chapter on boundary problems, and the final chapter by B. K. D. Gairola concerns non linear elastic problems, which is complicated by the use of inappropriate vector formulae and differential operators which act on the preceding rather than the succeeding quantity. The author does, however, provide alternative precise tensor formulations for each vector equation and an appendix on tensor theory, which is not the best I have seen. Both of these articles have 1976 addenda.

Technically, the book is well produced and attractively type-set. My overall impression is that the book makes a worthwhile contribution to our overview of the subject and makes a good start to a series which subscribers may purchase at a 15% discount on the total price of Dfl 790.

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Introduction to solid state electronics. By F. F. Y. WANG. Pp. xii + 266. Amsterdam: North-Holland, 1980. Price US $23.75, Dfl 48.50.

This is a brief textbook on an important, fast-moving subject, well printed and bound. The mathematics is treated briefly and yet thoroughly. Unfortunately, careful examination shows this to be a very poor undergraduate text. The *Table of contents* shows that it does not cover the material suggested by the title. It is really an introduction to conventional semiconductor physics. It starts from a very elementary level and only gets as far as p–n junctions, surfaces and MIS structures in the last two of the 15 chapters. Physical concepts are badly explained, the relevance of the material to solid-state electronics, in the few places where there is any, is not brought out. There are two pages on tunnelling through potential barriers but there is no mention of tunnel diodes, Esaki or superlattices, for example. Much unnecessary material is included and there are a number of careless mistakes. A few examples illustrating these points are as follows.

The first sentence gives the wrong year for the discovery of the transistor. The third and fourth figures in the book are interchanged. Semiconductors are only reached in chapter 8 (out of 15) and yet seven pages are devoted to explaining and tabulating the electron states of all the elements of the Periodic Table. This section also contains the statement that the atomic numbers of the inert gases are given by $Z = 2\sum n_i^2$ where $n_i = 1, 2, 3, \ldots$ (equation 5.9.1, p. 79). This is wrong from $n_i = 3$ onwards. Expressions for wave functions are consistently referred to as wave equations which will irritate good students and baffle weak ones. Chapter 14 on the p–n junction is taken uncritically from a 1949 paper by Shockley with the result that (a) the energy band diagrams are upside down by modern convention, *i.e.* the valence band is at the top and the conduction band at the bottom and (b) the depletion region as it is now known is referred to throughout as the transition region. To Shockley's algebra and diagrams the author has added his own mistakes. Figure 14.1.1.(c) is identical to 14.1.1.(b) and does not show the quasi-Fermi levels mentioned in the caption and the text and shown in Shockley's original figure. The quality of the explanations of physical ideas is shown by the second paragraph of this chapter which ends as follows 'The rectifying process occurs in the transition region. Appreciable hole currents may flow into the n-type region beyond the transition region. Therefore, the rectifying process is not limited to the transition region. The volume of a semiconductor specimen within which the rectifying process occurs is generally termed the junction and includes the transition region and beyond.' Comment: The whole passage is unnecessary and confusing. Sentence 1 of this passage is wrong and contradicted by sentences 3 and 4. Sentence 2 is less than half the story. The electrons will be injected into the p-type material also in forward bias while neither type of carrier is injected under reverse bias. Sentence 4 is excessively vague and pointless.

Conclusions: This is not the book of the title and cannot be recommended to students. It is a pity that the author, who has on the whole handled the mathematics well, did not put an equally successful effort into checking facts, explaining ideas and relating the work to solid-state electronics.

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Books Received

The following books have been received by the Editor. Brief and generally uncritical notices are given of works of marginal crystallographic interest; occasionally a book of fundamental interest is included under this heading because of difficulty in finding a suitable reviewer without great delay.

Сегнетоэлектрические пленки сложных окислов металлов, Ю Я. Томашпольский, Г. Л. Платонов. Стр 200. Москва «Металлургия» 1978. **(Ferroelectric films of metallic complex oxides.** By Yu. Ya. Tomashpolsky and G. L. Platonov. Pp. 200. Moscow: Soviet Metallurgy, 1978). Price 1p 70k. A review of this book, by A. M. Glazer, has been published in the December 1980 issue of *Journal of Applied Crystallography*, page 636.

Handbook of semiconductors. Vol. 2. Optical properties of solids. Edited by M. Balkanski. Pp. xiv + 633. Amsterdam, New York, Oxford: North Holland Publishing Company, 1980. Price US\$122.00, Dfl 250.00. A review of this book, by M. A. G. Halliwell, has been published in the December 1980 issue of *Journal of Applied Crystallography*, pages 637–638.

Theory and practice of direct methods in crystallography. Edited by M. F. C. Ladd and R. A. Palmer. Pp. xiv + 421. New York and London: Plenum Press, 1980. Price US\$35.00. A review of this book, by Peter S. White, has been published in the November 1980 issue of *Acta Crystallographica*, Section B, page 2860.

Handbook on the physics and chemistry of rare earths. Vol. 2. Alloys and intermetallics. Edited by K. A. Gschneidner and L. Eyring. Pp. xiv + 620. Amsterdam: North-Holland, 1979. Price US\$97.50, Dfl 200.00. A review of this book, by D. G. Lord, has been published in the October 1980 issue of *Acta Crystallographica*, Section B, page 2512.

Handbook of liquid crystals. By H. Kelker and R. Hatz. Pp. xviii + 917. Weinheim: Verlag Chemie, 1980. Price DM 420.00. A review of this book, by G. W. Gray, has been published in the November 1980 issue of *Acta Crystallographica*, Section B, page 2861.