The book contains several obvious misprints. All these can readily
be corrected without too much trouble. One of the important contri-
butions is the extensive listing of European bibliography and books
relevant to the subject matter. This is especially useful for U.S.
readers.

REVIEWED BY W. F. CHEN

This book is one of only two books dealing exclusively with the
calculation of plastic collapse loads in soil mechanics. The first book
titled Limit Analysis and Soil Plasticity published by Elsevier,
Amsterdam, in 1975 by this reviewer (see AMR Book-3971, 638 pp.)
is concerned mainly with the theory of limit analysis and its application
to practically important problems of soil mechanics. It contains
many worked examples and many results are summarized in graphical
or tabular form suitable for direct use. The present book deals ex-
cursively with the mathematical aspects of the theory of the rigid-
plastic model which can be used in soil mechanics. It contains the two
main subjects: slip-line and limit analysis. The purpose of the book,
according to the author, is to help the worker in soil mechanics to
understand better how plasticity theory can affect his subject and to
enable him to appreciate the meaning and usefulness of the computa-
tional methods available. It is not intended to replace the well-
known book of Sokolovski (Statics of Granular Media, Pergamon
Press, Oxford, 1965) which contains many slip-line solutions in
graphical or tabular form for practical use, nor the recent book of
Chen on limit analysis. Rather, the book brings together and presents
rigorously the mathematical and physical aspects of the theory of
plasticity as relevant to the applications in soil mechanics. Hence,
except for the very simple examples that are given for an illustrative
purpose, the book contains no complex analytical and numerical solu-
tions of more or less classical problems of plasticity linked to soil
mechanics.

The contents of the book are as follows: Chapter 1 presents the basic
concept of plasticity which consists of two main parts: yield criterion
and flow rule. The presentation is based solely on the assumption of
convexity of yield surface and the Hill's principle of maximum plastic
work which results in the normality of the flow rule. The concept of
Drucker's postulate on the definition of work-hardening material has
not been utilized. Chapter 2 briefly reviews the elastic-plastic problem
which is a basic problem as soon as one introduces plasticity into the
material behavior. This leads to the discussion of what types of con-
dition, hypotheses and problems for which one can use the rigid-
plastic idealization. This question, in its generality, constitutes the
objective of the third chapter. The various ways of defining and
considering the rigid-plastic material are examined, and the method
of stating limit equilibrium problems (slip-line theory) is studied.
Chapter 4 is devoted exclusively to a detailed study of the theory of
slip-line. The appendices of Chapter 4 present the extension of the
plane strain theory to nonhomogeneous material as well as to the
axially symmetric problems. Finally, the theory of limit analysis is
dealt with in Chapter 5 for standard material (with associated flow
rule). The appendices of Chapter 5 present the extension of the limit
theory to some nonstandard materials.

Throughout the development, the case of a material with an asso-
ciated flow rule is examined first and the validity of the range of ap-
plicability of the results is determined. The case of a material with
a nonassociated flow rule is then considered. The deficiencies in this
latter case are shown, together with the positive points that can be
used as foundations. The yield criteria used in the book are 'Yresca
criterion for undrained clay and Coulomb criterion for $\phi$-soils.

Chapters 3, 4, and 5 are followed by one or several appendices and
each of the chapters and appendices has its own references placed at
the end of that chapter or appendix. This makes the reading very
inconvenient. They should appear after each chapter, appropriately.

The book contains several obvious misprints. All these can readily
be corrected without too much trouble. One of the important contri-

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elaborate numerical methods such as the one developed by Longuet-Higgins and Cokelet (1976) for finite waves in deep water (which has been executed to an early stage of wave breaking). Fenton and Mills [9] extend this method to finite depth and discuss their experience with the underlying numerical instability. A novel idea is provided by Hornung and Killen [12] who demonstrate laboratory results of three-dimensional breaking waves obliquely incident on a sloping beach (with a progressing point of breaking) and use these results for studies of the analogous two-dimensional normal breaker. Some interesting effects of wave breaking on momentum and energy transport are discussed by Longuet-Higgins [13] with demonstrative films showing wave forces on a floating or submerged body. A broad discussion is covered by Bowen [10] on various types of resonant wave interactions in near-shore zones.

In addition to the variable depth effects, three papers introduce further complications of stratified rotating fluids. They cover several special interests of the vast field, ranging from an elegant linear theory of Roseau [17] for the propagation of waves in two layers, through finite-difference computations by Mooers [18] with a linearized two-layered model, to attempts of modeling low-frequency oscillations in channels for comparison with observed data by Helbig and Mysak [19].

It is perhaps not an accident that the important part on "long period barotropic waves" consists of all Australian contributions as much research interest has been stimulated by the expansive shoreline of Australia and her substantial continental shelf. Buchwald and co-workers [20-22] discuss a number of problems concerning shelf waves, including their nonlinear generation (by a periodically blowing wind along an interior shelf), their diffraction by coastlines, and their resonance under conditions that approach laboratory experiments. Further, Grimshaw [23] discusses the nonlinear aspects of shelf waves (of the KdV class) and wave-induced mean flows. McKee [24] reports his findings on the modification of continental shelf waves induced by a sheared geostrophic current. What is of unique value to the interested researcher are the rich oceanographic data garnered by B.V. Hamon during the past 3-4 decades along the Australian coast, some of which are used to discuss the shelf waves generated by wind stress [26]. These waves cover a range of periods from 4-25 days. It is appropriate that the meeting concludes with a report by Kraus and Rajak [26] on very long waves along the south coast of Australia; these waves have amplitude of 1m, periods of 5-8 days, and wavelengths of 3500-5000 km.

In summary, a great variety of water wave phenomena have been investigated and many authors took pain to consolidate a self-consistent state of knowledge by examining the validity of results of various theories in areas where differing methods overlap. Although there are important regions of marked gaps, these problems have become better focused for future studies. It has been a most interesting symposium to attend and this volume of proceedings will be a work of lasting value.

Erratum


Equation (20) should read:

$$h = -\frac{v}{2}$$

Subsequently the series solution in Table 2 compares even more favorably with numerical integration.

The last term in equation (45) should read:

$$w_0 a_0^2 D^4 f_n(-1)^n$$

where $a$ is the shear current in the geostrophic sense.