chain of shell-model atoms which consist of a core of nucleus and inner electrons surrounded by a shell of outer electrons. This model involves core-core, core-shell, and shell-shell interactions, and by reference to the limit of long waves Mindlin shows which of these interactions accounts for effects described by the classical, and his augmented continuum theory.

In reviewing a contribution of Mindlin, it is often difficult to avoid superlatives. This is certainly the case with this monograph, which is a most lucid discussion of the classical literature and Mindlin's own seminal work on the theory of elastic dielectrics.

Theory of Elasticity. By H. Leipholz. Noordhoff International Publishing. 1974. 400 Pages. $39.20 Cost.

REVIEWED BY J. W. HUTCHINSON[4]

This book is primarily a text, at the graduate school level, which gives a modern applied mechanics approach to elasticity theory. A small excursion into nonlinear aspects of the subject is made but essentially the book deals only with linear elasticity. (In particular, the book has nothing to do with stability theory even though it is the first of a new series by Noordhoff entitled *Mechanics of Elastic Stability.*) General tensor analysis is developed in the first chapter and is used in the analysis of stress and strain in the next two chapters. Then governing equations are set out for general curvilinear coordinate systems. A number of the classical two and three-dimensional solutions are presented including pure bending, torsion, various plane problems (some using Muskhelishvili methods) and some concentrated force problems in three dimensions. There follows a short chapter on energy principles which draws on examples from beam theory. The last two chapters develop linear plate theory in some detail and a form of linear shell theory in rather less detail.

Emphasis is placed on theoretical development of equations for the most part. No set problems are included in the chapters but worked examples are used throughout to illustrate the theory. As a potential course text the book should be compared with older books which have been widely used (either singly or in combination) such as those by C. E. Pearson and I. S. Sokolnikoff and with more recent texts which cover some of the same ground such as that by Y. C. Fung. No attempt at any comparisons will be made here since each instructor will want to draw his own conclusions consistent with his attitudes and the aims of his course.

Buckling of Bars, Plates, and Shells. By Don O. Brush and Bo O. Almroth. McGraw-Hill Book Company. 1975. 379 Pages. Cost $21.00.

REVIEWED BY J. W. HUTCHINSON[5]

Buckling has been one of the most active and vital research areas in solid mechanics but, perhaps for just that reason, few books have appeared on the subject in the last 15 years. For most English speaking practitioners the text by Timoshenko and Gere (originally that of Timoshenko alone dating from 1936) remains the main standby, particularly for instructional purposes. Russian bucklers have been fortunate to have A. S. Vol'mir's treatise. (An earlier edition has also had limited circulation in this country as an Air Force translation.) Within the last couple of years a sudden rush of new books have appeared on the stability of conservative elastic systems, including books by S. J. Britvec, J. G. A. Croll and A. C. Walker, J. M. T. Thompson and G. Hunt, C. L. Dym, and K. Huseyin. All of these books are rather specialized and none deal extensively with the gutsey subjects of plate and shell buckling which have application in so many engineering fields. The new book by Brush and Almroth is a real buckling text. Don't throw away your worn copy of Timoshenko and Gere yet, though. This new book covers some of the same ground as Timoshenko and Gere, generally in a more systematic way bringing to bear the advantage of increased understanding of the subject, but it comes into its own where it leads into topics such as nonlinear analysis, postbuckling behavior, and numerical methods. Thus the book complements that of Timoshenko and Gere.

Somewhat less than the first half of the book deals with bars, plates, and circular rings. Orthotropically stiffened plates are discussed. Ring buckling is discussed in a way to bring the reader naturally into contact with cylindrical shells in the next chapter. Karman-Donnell equations are derived in two ways via a direct equilibrium method and via an energy approach. A set of accurate first-order linearized buckling equations is also derived. A number of classical buckling solutions are given along with comparisons with experimental data. The sixth chapter deals with nonlinear equations for general shells and presents Sanders' equations and the Donnell-Mushtari-Vlasov equations. A brief discussion of Koiter's general theory of postbuckling behavior is given in Chapter 7 along with a number of examples illustrating imperfection-sensitivity. Chapter 8 discusses various numerical methods for solving the buckling equations which arise in the various contexts. This chapter merges nicely with the rest of the book and is successful at giving the reader some feeling for the considerable progress which has been made in this aspect of the subject in the last 15 years. The last chapter is titled Nonlinear Analysis and discusses topics such as the postbuckling behavior of plates, bifurcation from a nonlinear prebuckling state, and the Brazier effect.

Modern Mathematical Methods in Technology, Volume 2. By S. Fenyo. North-Holland Publishing Company. 1975. 326 Pages. Cost $39.75.

REVIEWED BY W. R. SPILLERS[6]

This volume is part of the recent trend in which engineering mathematics texts are beginning to respond to newly developing areas of technology. It furthermore bears an interesting relationship to the excellent book of Luenberger (*Optimization by Vector Space Methods*, John Wiley and Sons, New York, 1969):

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