A. E. Green and W. Zerna: Theoretical Elasticity, 2nd edition, Clarendon Press: Oxford University Press, 1968, XV + 451 p., price 105 sh.

The three main subjects considered in this book are the general theory of finite elastic deformations, complex variable methods for two-dimensional problems for both isotropic and aeolotropic bodies, and shell theory, the latter topics being confined to classical infinitesimal elasticity.

In chapter 1 tensor and vector notations are summarized, which are consistently used throughout the book whenever appropriate. Chapter 2 contains an account of the general theory of elasticity for finite deformations. Special attention is given to the formulation of stress-strain relations for an isotropic body. Chapter 3 contains solutions of a number of special problems, mostly for incompressible isotropic bodies, and in chapter 4 a theory of small deformations, which are superposed on finite deformations, is given.

In chapter 5 the classical infinitesimal theory of elasticity is deduced as a special case of the general theory developed in chapter 2. The chapter closes with the solution of some three-dimensional problems for both isotropic and transversely isotropic bodies.

Chapters 6 and 7 deal with plane strain and plate theories for both isotropy and aeolotropy and are first developed in tensor notation. By specialization of this general form of the two-dimensional theories it is possible to introduce complex variable notations in a consistent and natural manner. Two-dimensional problems are discussed in chapter 8 for isotropic bodies, and in chapter 9 for aelotropic bodies for plain strain, and for plates deformed by forces in the planes, using complex function theory.

The last six chapters on linear shell theory have been altered considerably since the first edition of this book, which appeared in 1954. Chapter 10 contains exact results for shells. Chapters 11 and 12 are concerned with membrane theory, and a bending theory of shells which is satisfactory provided that stresses arising from inextensional deformations are unimportant. The equations of these chapters are given in general curvilinear coordinates and the special forms the equations assume for cylindrical shells and for shells of revolution are studied in chapters 14 and 15. The general theory of shallow shells, based on the bending theory of chapter 12, is contained in chapter 13. Finally a new chapter 16 is added, which deals with methods of deriving membrane theory, inextensional theory, and bending theory, by asymptotic expansions of the three-dimensional linear elastic equations.

For research workers in the field of theoretical elasticity this book is likely to remain a standard book of reference for many years.

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