Mathematical Theory of Elastic Equilibrium (recent results), by Giuseppe Grioli. Ergebnisse derangewandten Mathematik No. 7. Academic Press Inc. New York and Springer-Verlag (Berlin-Gottingen-Heidelberg), 1962. viii + 168 pages. $7.25.

This important monograph on the theory of Elasticity reports some recent results, mostly by Italian mathematicians. The major problems tackled in the book are

1) The form of the Elastic potential function is investigated under the hypothesis that there exists a stress-free state of equilibrium such that the work done by internal contact forces is negative for any isothermal non-rigid displacement starting from it, and that in this state (of free equilibrium) the body is isotropic and homogeneous.

2) The problem of static elasticity (finite deformations) is reduced to the solution of an infinite sequence of problems in linear elasticity, under the hypothesis that strains and stresses are analytic functions of a parameter θ, in the neighborhood of $\theta = 0$.

3) Some aspects of the theory are investigated in which the strain and stress tensors are assumed to be asymmetric. A simple example is given to show that certain types of stress singularities in the solutions of elasticity problems may be removed by dropping the assumption that stress tensor is symmetric.

The presentation is clear. The proofs of many theorems are omitted but this would be inevitable in a book of this size, which contains an amazing amount of information.

There are minor misprints in the book here and there.

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Anti-plane Elastic Systems, by L. M. Milne-Thomson. Academic Press, New York. Springer-Verlag, Berlin-Gottingen-Heidelberg, 1962. 265 pages.

The author calls a stress-system antiplane if there exists a fixed plane Π (called the antiplane) such that the only stress component which can depend upon distance from Π is the stress component normal to Π. Under two further assumptions namely (I) the body-field is independent of distance from the antiplane Π (II) the body-field is derivable from a potential, the author reduces the static problem of infinitesimal anisotropic elasticity to the determination of three complex stress functions which have to satisfy suitable boundary conditions.