Institute for Chemistry in 1912, Hahn was invited to head a department of radioactivity at the institute and remained there until the end of the second world war in 1945. The account of this scientifically very fruitful period of his life is entirely devoted to his researches. There is a graphic description of the confusion and uncertainty surrounding the early work that led to the epoch-making discovery of uranium fission in 1939. Full credit is given to the previous work of Enrico Fermi, Irène Joliot-Curie, and the later explanatory considerations of Meitner and Otto Frisch. The only reference to the realization of the possible technological significance of nuclear fission is a one page discussion of S. Flügge's paper in a later issue of the same volume of *Die Naturwissenschaften* (volume 27, 1929) in which the fundamental article on uranium fisson by Hahn and Strassmann appeared. Nothing is said about German military research on the atomic bomb, and the author contents himself with describing his work in the period 1940–45 on the disentanglement of the various radioactive substances produced by fission.

As has already been intimated, practically the whole book is restricted to descriptions of the scientific research carried out by the author and his collaborators. This is set forth in clear if somewhat pedestrian style. To the historian of science the material will serve as a very valuable source for the development of the history of radioactivity and nuclear physics. Even the layman will catch some of the spirit motivating the researcher and will admire the insight and skill with which his experiments were designed and carried out.

Three appendices, totalling some 80 pages, contain translations in full of three of Hahn's important papers, including the famous one of 1939. A complete bibliography of his publications and a series of photographs of Hahn and some of his celebrated contemporaries add to the interest and value of the volume. Glenn T. Seaborg's introduction provides a useful setting, with its emphasis on the technological implications of nuclear fission.

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Mechanical properties of metals

ELEMENTS OF MECHANICAL METALLURGY. By W. J. McGregor Tegart. 259 pp. Macmillan, New York, 1966. Cloth $8.95, paper $4.95

by Daniel B. Butrymowicz

Volumes of the Macmillan Series in Materials Science have been generally well received since their initial publication in 1964. Tegart's contribution to the series continues the line of quality one has come to expect from this series.

The author makes use of the approach practiced in the lecture courses for students in the metallurgy department at the University of Sheffield. The book was written with the aim of providing a background of basic information against which readers can set their knowledge of dislocation theory in order to interpret current theories of mechanical properties.

The first three chapters deal with stress-strain relationships in static and dynamic tension, compression, shear and torsion. Since the tensile test is the most widely used test for determining mechanical properties of metals and alloys, the author devotes a significant part of the discussion to its characteristics and to the importance of the stress-strain relationship under tensile loading. Applicable for those metals that do not lend themselves to such testing (those metals with low rates of strain hardening, those that fracture under low stress in tension, etc.) is the compression test, discussed in somewhat less detail. The direct shear test and the torsion test in studying mechanical properties are also described in some detail. In chapter 4 the treatment of elasticity concepts is extended to include more complex stress systems.

Slip, twinning and other deformation modes are elaborated upon in a chapter on the plastic properties of single crystals. The form of the stress-strain curve from single-crystal deformation is discussed here also and is one of the best portions of the book. The plastic properties of polycrystalline aggregates is equally well treated in the following chapter.

The book is concluded with a chapter on fracture, with the bulk of the discussion on the characteristics, nucleation and propagation of cracks in brittle, ductile and fatigue fracture.

Each of the chapters is followed by suggested further reading (a list of reviews and books) and several pages of relatively simple numerical problems (no answers supplied). There are approximately 300 detailed references listed alphabetically at the end of the book for those who wish to search further.

The book has no photomicrographs, the author preferring the use of sketches. Graphical representations of experimental results assist the reader in his understanding of the textual material. The mathematics is rather elementary and should be handled easily by undergraduate students. However, a knowledge of basic crystal structures and crystallographic nomenclature is assumed.

The author avoids many of the controversial questions relating to the phenomena of plastic deformation, although he does let the reader know such questions exist. In spite of the fact that much emphasis has been placed on applying dislocation theory to the interpretation of plastic deformation phenomena, he shuns the details of many of these theories.

It was the author's intent that his book should complement another volume to the Macmillan Series, namely *Elementary Dislocation Theory* by Weertman and Weertman. Some may not favor the division of the subject matter, but there is no question that when accompanied by the Weertmans' book the value of Tegart's work is greatly enhanced. In any event, the book is good reading for undergraduate students and for practicing metallurgists who desire to reacquaint themselves with the mechanical properties of metals and alloys.

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