art and gives selected references to literature in Russian, English and German.

The first chapter by Ya. B. Fridman covers general problems of mechanical and thermal strength of materials, principally metals. Distinctions are made in the origin of loading (whether mechanical or thermal) and in four types of loading: shock, short-time, long-time and repeated. Topics discussed include: plasticity, creep, flaws, residual stress and fatigue.

The second chapter by E. M. Morozov and Ya. B. Fridman contains a useful summary of formulas for thermal stress in bodies with various configurations and thermal gradients. The formulas are largely for elastic bodies and include a number of less well-known formulas along with the familiar ones. Of particular interest are

1) a solution for a plate in the elastoplastic range and

2) a numerical example for a successive approximation solution of a tube in the plastic range.

Thermal fatigue and shock are surveyed in the third chapter by N. D. Sobolev and V. I. Egorev. The principal findings of numerous investigators are summarized, and numerical examples of fatigue life calculations are given for the approaches suggested by Coffin, Langer, and Manson.

The fourth chapter by B. F. Shorr develops the mathematical theory of creep and applies it to bars of arbitrary cross section and hollow cylinders.

The last chapter on thermal stability of plates and shells is by L. A. Shapovalov. The discussion covers flat and curved plates of rectangular planform, circular plates with and without a central hole, and a cylindrical shell.

The reader will find a number of useful ideas and methods in this book which may help with a particular thermal-stress problem. The second chapter with the compilation of solutions will probably be the most frequently used. A definitive treatise on thermal stress has yet to be written and probably will not be in the foreseeable future, since many problems of practical consequence involve elastoplasticity and fairly complex configurations. Practicing engineers will find this book a welcome increment to their knowledge of thermal-strength problems.

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POWER FROM ISOTOPES

Title Radioisotopic Power Generation
Authors William R. Corliss and Douglas G. Harvey
Publisher Prentice-Hall, Inc., 1964
Pages xi + 304
Price $14.75
One of Prentice-Hall's Space Technology Series

Reviewer Robert F. Cooper

Radioisotopic Power Generation covers comprehensively the design of radioisotope generators from fuel selection to actual applications. The material included in this book has not previously been collected into any single book of which I am aware.

In general, the book is excellent in its scope and an infinite improvement over what was previously available. It comprises a complete history of radioisotopic generators. The most informative chapters are those dealing with generator design, nuclear safety and nuclear batteries. Most of the remainder of the text is quite adequate.

However, major improvements could be made in the important areas of energy conversion, thermal applications of isotopes, and advanced concepts. The area of energy conversion was glossed over too lightly and should have been given more detailed coverage. The thermal applications of radioisotopes would also have been a very significant addition to this book. Certainly detailed coverage of *Poodle* and *Snapoodle* concepts should have been included—perhaps under advanced concepts.

The constantly changing area of isotope availability and costs is handled as well as possible. For proper planning, this area should not be considered inflexible or limiting. (It is encouraging to see the very practical unit of thermal watts becoming more generally used in reference to the availability and production of radioisotopes).

In summary, this text is an excellent first attempt to bring together closely related but previously widely dispersed information in this important field. As such it is a valuable reference. However, strengthening the chapters mentioned and the addition of the Soviet information released at Geneva this past summer would have improved the text.

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