

Bioengineer's Bookshelf

Contemporary Biomaterials: Material and Host Response, Clinical Applications, New Technology and Legal Aspects, ed. by John W. Boretos and Murray Eden, NIH, Bethesda, Maryland, publ. by Noyes Publishers, Park Ridge, New Jersey, June 1984. Cloth \$84.00 (US). xxvi + 672 pp.

This is a book written by 58 authors. It is a comprehensive presentation of issues concerning biomaterials in 6 sections, 33 chapters, and an appendix. Some chapters are long (Ch. 17, 63 pp.; Ch. 19, 55 pp.; Ch. 10, 47 pp.). Some chapters are short (8 Chs. 3-5 pp. ea). The long chapters present detailed information. The short ones either introduce the subject or offer critiques of the papers to follow. Hence, this is a book which contains reviews and critiques of itself. It is like a forum, and very refreshing at times.

Pierre Galleti wrote a good preface which introduces the whole book by saying that twenty-five years ago the concept of biomaterial was largely wishful thinking. The book then proceeds in the following sections:

- 1 The Status of Biomaterials
 - 2 Properties, Structure, and Performance of Biomaterials
 - 3 Host Response to Biomaterials
 - 4 Clinical Experience with Biomaterials
 - 5 New Biomaterial Technology
 - 6 Economic, Regulatory, and Legal Aspects
- Appendix, NIH Conference Statement on Clinical Applications of Biomaterials.

The broad scope makes this book very useful to many people. In a book for an interdisciplinary field like biomaterials, such a broad scope is justifiable. An engineer or surgeon may find it very interesting to scan over the chapters on FDA regulations, the cost dilemma and cash flow. Similarly, users of biomaterials may find the scientific part of the book very impressive. For example, Professor Edward Merrill's article (Ch. 5) on the Influence of Physico-Chemical Properties on Material Response, cannot but impress us with the tremendous power of general reasoning from chemistry and physics on the practical subject of inventing or selecting biopolymers. By looking at the molecular structures he was able to predict or explain some properties of polyethylene, polydimethyl siloxane, and segmented polyurethanes. His critique of parts of the *Guidelines for the Physicochemical Characterization of Biomaterials*, issued by the Devices and Technologies Branch, National Heart, Lung, and Blood Institute, 1979 (NIH Pub. No. 80-2186, 1980), is penetrating and exemplary.

There is a wealth of materials in this book. I recommend it to bioengineers.

Reviewed by
Y. C. Fung
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Biorheology (in Japanese) by Syoten Oka, publ. by Shokabo, Tokyo, 1984. Price: Yen 4500, xi + 292 pp.

This is a revised edition of the author's 1971 book entitled *Rheology—Biorheology*. The first edition has 11 chapters and 481 pp. In this revision, 5 new chapters were added. The contents are as follows:

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| Chapter 1 | Rheology and Biorheology |
| Chapter 2 | Concepts of Rheology |
| Chapter 3 | Circulation |
| Chapter 4 | Blood Viscosity |
| Chapter 5* | Deformability of Red Blood Cells |
| Chapter 6* | Electric Properties of Blood |
| Chapter 7* | Erythrocyte Sedimentation |
| Chapter 8 | Microcirculation |
| Chapter 9* | Electric Properties of Blood Vessel Walls |
| Chapter 10 | Rheology of Blood Vessels |
| Chapter 11 | Pulsatile Flow |
| Chapter 12* | Permeability of Blood Vessel Walls |
| Chapter 13* | Clinical Hemorheology |
| Chapter 14 | Optimality Principle and Branching of Blood Vessels |

Those marked by asterisks are new chapters. Dr. Oka is a well-known author. His books (including *Cardiovascular Hemorheology*, Cambridge University Press, 1978, in English) are known for their clarity and conciseness, and this one is no exception. The quality of conciseness is even more stressed in this new book. After incorporating the many advances of the past 13 years, he was able to reduce the length of the book by 189 pages! This is achieved by reducing mathematical treatment in favor of qualitative discussions. The result is a greater accessibility to physicians, biologists, and general readers, but less attention to the needs of engineering students. This book is highly recommended.

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Replacement of the Knee by R. S. Laskin, R. A. Denham, and A. G. Apley, publ. by Springer-Verlag, New York, Inc., 1984, 222 pp.

"In the early chapters the neglected question of indications is considered, alternative methods of treatment are discussed and the spectrum of available knee prostheses are