molecular weight distribution by sedimentation transport. The characterization of branched and crosslinked macromolecules is reviewed and analyzed briefly and lucidly in papers by Graessley and by Shultz.

Most of the papers are well referenced, and the quality of the writing is uniform. There is no subject index, however, and the lack of experimental details in a number of the papers on current work further reduces the value of the book.

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Blood Flow

Rheology of the Circulation. R. L. WHITMORE. Pergamon, New York, 1968. xii + 196 pp., illus. $9.

The breadth of the subject matter of Whitmore's short monograph is considerable, spanning a distance from Kelvin-Voigt solids and other mechanical models all the way to blood chemistry and fluid mechanics in complex geometries. Comprehensiveness of treatment, however, has limited the depth of technical discussion to significant highlights and results, with frequent reference being made in the text to entries in the excellent list of more than 450 books and journal articles given as a bibliography. This is consistent with the intent, as stated in the preface, of providing a guide for nonrheologists, enabling them "to interpret the biophysics of the circulation in modern terms." For the reader with scant background in the life sciences, an outline of cardiovascular anatomy and physiology is provided. Although the range of the book is broad, the unifying theme of the implications of blood rheology for the cardiovascular system is emphasized throughout.

As is noted in the concluding chapter, a complete exposition of circulatory rheology seems very remote at present, and much of our current knowledge is tentative. In many instances, reports of conflicting experimental data make conclusions impossible to draw—for example, under what circumstances is blood plasma Newtonian, and when is it not? Whitmore is eminently fair in giving equal time to the work of researchers whose results appear to be in conflict, but at the same time he does little to resolve issues. This comparison of conflicting results brings home clearly the need for further research. For example, very little headway has been made so far toward clarification of our understanding of the rheology of blood flow in complex geometries or under pathological conditions. In addition, although the probable importance of various types of red cell aggregates is apparent, present understanding of the effects of particle-particle interactions on flow characteristics is insufficient to permit real insight.

Inasmuch as the author aims at the nonrheologist, and in particular the life scientist, it would be well to note that some confusion may result from the somewhat careless treatment given to some physical concepts, such as force, force per unit length, and stress, in the first chapter. Many of the freehand illustrations would have benefited from the use of drafting instruments and are not really acceptable in their present form. However, these two criticisms do not seriously detract from an overall impression that Whitmore has done an admirable job in selecting and condensing much of the pertinent literature of the past decade into a brief, worthwhile synopsis.

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Books Received

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