Sacks' real-world talk is very interesting in pointing out that sometimes a problem is "over-analyzed" by having too many papers concentrating on too much detail and forgetting about essential simplifications for a real-world solution. He used his development of a simple device for self-measurement of blood pressure on one’s finger as an example. Many intriguing questions are raised for a bioengineer in his/her function as an academic researcher, inventor, developer, and businessman.

The volume contains a number of original research published for the first time. For example, Downing’s paper on the maximum expiratory gas flow in the lung explores a unique point of view first stated by C. A. Jacobs in his 1971 PhD thesis at USC. Jacobs and Downing feel that the flow limitation arises because of "selective merging" of confluent flow from small branches into larger ones. When two tubes converge at one point, the one with larger flow and higher pressure can effectively block the flow in the other tube. Hence the effective total tube area in each generation of bronchi is smaller than the anatomical value.

The reviewer finds that the general scientific level of the papers is high. There are many very good papers on experimental and computational biofluid mechanics. There are papers providing data on pressure and flow relations in the bronchial airways, (Hardin, et al., Reynolds). There are excellent theoretical papers on unsteady flow by Lion, Clark, Robertson and Cheng, and by O’Brien and Ehrlich. Experimental investigations by Walburn, Schneck, Balasubramanian, Giddens, and Mabon on flow separation and carotid bifurcation are superior. There are several very good papers on heart valves. An unusual paper by B. W. Vorhauer on the bioengineering aspects on contraction applied to the development of a new female contraceptive device documents the various considerations and research efforts that went into the development of a practical device. But the reader would miss the interesting motion picture which was shown at the meeting.

These volumes testify the vigorous state of development of biomechanics in the United States.

Y. C. Fung, University of California, San Diego, La Jolla, Calif.

Mechanics in Medicine and Biology, Digest of 2nd International Conference, Osaka, Japan, June 5-7, 1980, Hiroshi Abe, Chairman of Organizing Committee, Osaka University Medical School.

This is a volume of extended abstracts of 9 keynote lectures and 62 free communications. The keynote lectures were given by Ghista, Sugawara, Chato, Suga, Hung, Kajiya, Chien, Reul, and Skalak on a variety of subjects. Ghista compared the American model of biomechanics research support with those of Germany and Japan. Suga discussed the left ventricle; Sugawara discussed the large arteries; Reul, et al., on the artificial heart valves; Chato on heat transfer; Chien on macromolecular transport; Skalak on microcirculation; Hung on spinal cord; Kajiya on laser doppler velocimetry. Of the contributed papers, there are 12 on flowmetry, 9 on fluid dynamics, 5 on microcirculation, 7 on vessels, 7 on cardiac mechanics, 7 on coronary circulation, 4 on biomaterials, 5 on valves, and 6 on other subjects.

Y. C. Fung, University of California, San Diego, La Jolla, Calif.


This popular book is one of the "best-buy" basic tool reference sources of applied mathematics. The new edition is enlarged with the point of view that modern users are more concerned with the formulation of the problem, and on estimation of errors of computer generated results. The new sections added are: 10) vector field theory, 11) algebraic inequalities, 12) integral inequalities, 13) matrices and related results, 14) determinants, 15) norms, 16) ordinary differential equations, 17) Fourier and Laplace transforms. Sections 0-9 are the older material, enlarged, covering elemental functions, indefinite integrals, definite integrals, logarithmic functions, and special functions, with a total of 1080 pp. The new sections consist of the last 80 pp. The editor says that "all known errors are corrected." An introduction written by the editor, Jeffrey, on "Use of the Tables," is very helpful.

Mathematically oriented bioengineers should have a copy of this book on his/her bookshelf.

Y. C. Fung, University of California, San Diego, La Jolla, Calif.


These two volumes of introductory mechanics are remarkably well written. The very large number of worked-out examples and the many problems for solution make the book easily accessible to the beginners. Forty percent of the problems are new. The instructor’s manual presents many practical and helpful remarks about teaching. I am impressed by how streamlined the presentation is. It is a superior book.

Y. C. Fung, University of California, San Diego, La Jolla, Calif.