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The Scientists' Bookshelf

Life in Moving Fluids: The Physical Biology of Flow. Steven Vogel. 352 pp. Willard Grant Press, 1981. $23.50

It is difficult to think of organisms that do not have liquid or gas flowing within or around them. Although "the interface between biology and fluid mechanics [is] a broad, intriguing field rife with possibilities," Steven Vogel points out that "fluid flow is not currently in the mainstream of biology." There are engineering books on fluid dynamics and biological publications on diverse aspects of fluid flow, from ciliary propulsion to wind in forest canopies. Nonetheless, most biologists shy away from the hairy mathematics involved in the former, and therefore may not appreciate the latter. At last, with Vogel's book, we have a beautifully clear and entertaining introduction to biological fluid flow that is accessible to the average biologist.

Vogel's book is neither a mathematically rigorous fluid dynamics text nor a thorough review of the field of "biofluidmechanics." Rather, the book emphasizes intuitive appreciation of certain biologically important aspects of fluid flow. Using lucid language, simple equations, and uncluttered diagrams, the author explains some of the basics of fluid mechanics and illustrates the relevance of each to biology with well-chosen examples. He also challenges readers by offering intriguing speculations and by pointing out many of the holes in our present knowledge of biological flow.

Several features of Vogel's book make it extremely useful to biological researchers: examples of empirical approaches to biological flow problems, warnings about appropriate use of the equations, and appendixes full of practical advice on gadgetry for measuring and creating flow. Although this book is aimed at empirical biologists, mathematical fluid dynamicists can find in it a wealth of curious biological problems to which they might apply their skills. This book could also serve as an engaging text for a course on biological fluid flow (problem sets are available from the author).

The prose is wonderfully clear and entertaining; the humor and nice turns of phrase make even the potentially dull introductions to basic physical principles very digestible. The author's delight in his subject matter shines through in every chapter. As Vogel says: "The visceral biologist revels in the cleverness of the living world. I find this interface between fluid flow and the functioning of organisms particularly rich in these pleasures; perhaps the reader will also." This reader did.—*M. A. R. Koehl, Department of Zoology, University of California, Berkeley*