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Sommario/riassunto	The book reprints a set of important scientific papers applying physics and mathematics to address the problem of selective ionic conduction in narrow water-filled channels and pores. It is a long-standing problem, and an extremely important one. Life in all its forms depends on ion channels and, furthermore, the technological applications of artificial ion channels are already widespread and growing rapidly. They include desalination, DNA sequencing, energy harvesting, molecular sensors, fuel cells, batteries, personalised medicine, and drug design. Further applications are to be anticipated. The book will be helpful to researchers and technologists already working in the area, or planning to enter it. It gives detailed descriptions of a diversity of modern approaches, and shows how they can be particularly effective and mutually reinforcing when used together. It not only provides a snapshot of current cutting-edge scientific activity in the area, but also offers indications of how the subject is likely to evolve in the future.