

Talk across the barriers

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Membrane Transport: People and Ideas. Edited by Daniel C. Tosteson. *American Physiological Society*, 9,650 Rockville Pike, Bethesda, Maryland 20814, 1989. Pp.414. \$75. Distributed by Oxford University Press in Britain, £50.

IT MAY be hard for the membrane biologists of today to appreciate fully just how far and how rapidly their subject has progressed in this century. In the 1920s the very notion of a limiting membrane around cells was still controversial. It was only 57 years ago that the bilayer was firmly recognized as the basic ultrastructural component of biomembranes, and only 17 years have passed since the inclusion of protein in the bilayer was formally conceptualized by Singer and Nicholson. Since that time an increasing number of transport systems have been dissected and characterized both at the molecular and submolecular level.

The origins and development of the principles that underpin modern studies are given extensive treatment in *Membrane Transport*, a multi-authored volume written in celebration of the Centenary of the American Physiological Society. The book is wide ranging, starting with detailed accounts of the origins of the bilayer/unit membrane concept, moving through the principal modes of transport across membranes to ion selectivity and bioelectricity. Finally, the emergence of concepts in whole-cell phenomena such as cell-cell communication, epithelial transport of fluid and electrolytes are described.

The authors form a distinguished cast. Among them are people who figured prominently in the early development of membrane biology between 1930 and 1960, as well as others who are known for their work of the past 20 years. This breadth of perspective is quite unusual in contemporary books. Davson's article extends back into the middle of the 1800s to describe the first experimental evidence for the existence of membranes in plant cells, but then moves through to the mid-twentieth century and ideas about facilitated diffusion of ions across membranes.

Perhaps as a means of breathing life into an otherwise factual and rather dry history, the contributors were invited to give an anecdotal account of their roles in the scientific developments, including an impression of the personalities who influenced their work. It is this that gives the book its unusual flavour, although not all of the authors have used the device to



Sitting pretty — Isaac Newton, "a very great head of school but not pompous", depicted in a Japanese print c. 1869. The illustration comes from the new paperback edition of *Let Newton Be!* (Oxford University Press). The book was reviewed in *Nature* **337**, 28 (1989).

its full effect. Lowenstein's charming account of his work on cell-cell communication is a model of the genre, full of anecdote and personal observation, and giving a real feel of the excitement that follows a chance but crucial observation. Similarly, the article by Solomon on the practical difficulties of pre-war science is not only easy to read but gives a good impression of the 'heroic' nature of the research before the industrial production of scientific instruments got underway after the Second World War (his first task was to build a cyclotron for the production of radioisotopes!). Robertson's highly personal account of his work in the early days of the electron microscope and the unit-membrane concept is also enjoyable, especially as it relates to more recent concepts of ultrastructure. It is, though, twice the length of any other contribution and as such is tiresomely long.

Some of the other articles are disappointingly bland, giving more straightforward treatments of the progression of ideas with little personal embellishment save recording of the appearance or disappearance of colleagues as the story progresses. As a result they resemble rather too closely the review articles found

in contemporary multi-authored series.

Membrane Transport will provide good reading for postgraduate students and researchers who like to place the names that they frequently meet in the research literature into historical context. But the book also provides much that is of more than passing interest to those who make a career out of science. For example, there are numerous snippets of information and advice about working and publishing in a competitive scientific environment, advice which younger scientists should read with care. In addition, the recognition by more than one author that chance encounters and observations have played a large part in their achievements is cheering. But the most sobering notion is that provided by Danielli (quoted in Davson) in respect of the inevitability of scientific discovery. Having observed that the lipid bilayer was independently discovered at least three times, he concludes that "No scientist can afford to be arrogant about the degree of originality he achieves". Amen. □

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