A second question relates to Chapter 10, which deals with chelation and the stability constants of metal complexes. One should salute the wisdom of associating this topic, in the one volume, with the more usual one of acid-base equilibria. Having said this, one must regret that the new Chapter is very incomplete. There is, for example, no Table of stability constants, so that acetylacetone appears in Chapter 9 as an acid, but not in Chapter 10 as a complexing agent. A more serious question relates to the whole concept of specificity in metal ion complexation. One still remembers vividly that in the 'Biochemists' Handbook', published in 1961, Professor Albert said categorically: "Inspection (of the Table) will show that there is no specificity, and that there is seldom much variation in the order in which metals are preferred by various agents. Values for calcium resemble those for magnesium, some a little larger, some a little smaller". This statement seems to have been discarded wholesale over the last quarter of a century. We are now accustomed, rightly or wrongly, to think of complexing agents that have an absolute affinity for K^+ in the face of Na^+, or for Ca^{2+} in the presence of much higher concentrations of Mg^{2+}. This last question especially is of great importance both to biochemists and to biologists generally at the present time. Professor Albert would be doing a great service if, before he retires with honour from active scientific work, he were to give us his current thoughts on the relative affinities of polyvalent biological complexing agents for Ca^{2+} and Mg^{2+}, and especially if he could review methods for determining the stability constants of Ca^{2+} complexes at very low concentrations of this ion, in the presence of roughly equal concentrations of H^+, and of concentrations of Mg^{2+} perhaps two or three orders of magnitude greater.

J.H. Ottaway

The Biochemistry of Membrane Transport

by I.C. West

Chapman and Hall; London and New York, 1983

72 text pages. £2.95

This small volume is one of the successful Outline Studies in Biology series and serves to complement Edith Sim's recent volume devoted to Membrane Biochemistry in which the structure of cell membranes was dealt with. It provides a fairly readable account of selected aspects of the transport of ions and solutes through biological membranes and includes appropriate examples to illustrate the principles underlying various transport phenomena. The material is organised into six chapters starting with transport kinetics and working through facilitated diffusion and on to active transport processes. The final chapter contains some specific examples illustrating how control is exercised over different transport systems like acid secretion from the gastric mucosa, insulin regulation of glucose levels (although down regulation is not covered), ion movements in nerve conduction and vision and finally some transport pathologies are documented.

The treatment of the subject matter is precisely that expected for a biochemical audience and as such only reaches as far in explaining transport mechanisms as attributing them to conformational changes in proteins. Nevertheless, the molecular components of some of the membrane channel proteins and transport ATPases and how they are thought to be oriented in membranes were in general adequately described for the readership aimed at. No book of this type, however, could fit perfectly into the stated aims of the General Editors of the Series which is to bridge the gap between general texts and specialist reviews. This is because most of the currently available texts on cell membranes all have sections devoted to membrane transport. In this respect it meets some formidable

competition and is weakest in the breadth of subject matter covered. There is, for example, no reference to transport through gap junctions between cells. Perhaps the most serious omission is the lack of any discussion of the transport of macromolecules across membranes. The translocation of proteins, peptides, hormones, etc. across cell membranes after all is a large and important area of the subject. Furthermore, solute and electron transport processes in chloroplasts, mitochondria and endoplasmic reticulum do not feature prominently, if at all, and again one might have expected some treatment of these topics.

Adding up the pluses and minuses, the author has managed to explain some of the basic elements of membrane transport in a comprehensible manner for the introductory student. More comprehensive treatments, however, are to be found in the range of general texts on cell membranes published in the last few years.

P.J. Quinn

Mitochondria 1983. Nucleo-Mitochondrial Interactions

Edited by R.J. Schweyen, K. Wolf and F. Kaudewitz

Walter de Gruyter; Berlin, New York, 1983

642 pages. DM 240.00

I have never been to Schliersee, but from the snapshots in the front of the book it seems like a pleasant place to hold a conference. In July 1983 it was the venue for the third time for a meeting organised by the Genetics Institute of the University of Munich. The previous meeting, in 1977, took place at a time when studies on mitochondrial genes were beginning to burgeon. By 1983, the molecular biology of mitochondria had really come of age, with older problems, like those of transcription and the processing of mitochondrial RNA, rubbing shoulders with newer ones related to the nuclear genes involved in mitochondrial biogenesis. The Proceedings in this book are themselves a kind of a snapshot, a 650 page record of the progress that had been achieved at that point in time towards a full understanding of that dual encoded system and the mechanism of interaction of cytoplasmic and mitochondrial translation products.

The papers are grouped into five sections: Replication and transcription of mtDNA, RNA processing and splicing, Organisation and expression of mitochondrial genes, Nuclear control of mitochondrial functions, and Import of proteins into mitochondria. There are also three mini-reviews: Mitochondrial genes, mutants, maps (Dujon), Mitochondrial gene expression (Grivell), and Import of proteins into mitochondria (Yaffe). These reviews are good and do put into context several of the papers presented at the meeting.

It is not clear whether these reviews were plenary lectures or were written for the purposes of the book. In any event they are very useful as this is a complex field, with the 'simple' mitochondrial genome showing a staggering variety in the mode of organisation and expression of a small set of genes, and with bits of mtDNA appearing in the nucleus and bits of chloroplast DNA being found in mitochondria.

I found it disappointing therefore that there were not more reviews, ideally summarising each of the book's own sections, because without them the non-specialist is unlikely to get a great deal out of this book, which thus, after all, ends up as yet another Conference Proceedings. Nevertheless, apart from those camera-ready typefaces which are too small or too faint for middle-aged eyes, the book is well produced and indexed, and will be a useful record for active workers in the field, although its current rate of development is such that July 1983 may already seem a very long time ago.

H. Baum

Integrative Biochemistry 2 Lecture 4: Membrane Transport 1 Biological Membranes ï‚· Defines the external boundary of the cell ï‚· Separates intracellular compartments, e.g. nucleus, mitochondria, chloroplasts ï‚· Acts as a barrier for transport in and out of the cell ï‚· Characterised by fluid mosaic model Selective Permeability ï‚· Every cell must acquire nutrients, raw materials and energy sources from the external environment ï‚· Toxic products/extracellular signals must.Â K+, Clï‚· Glucose ï‚· Tryptophan ï‚· Urea ï‚· Glycerol ï‚· Water Active vs Passive Transport ï‚· Passive transport â€“ doesnâ€™t require energy o Driven by concentration or electrical gradients ï‚· Active transport â€“ requires energy o Works against concentration/electrical PTEX is a transporter protein anchored on the vacuole membrane. When malarial proteins are being transported, they are unwound into long peptides, which allows them to get passed through the narrow channel of PTEX. The unwound proteins then fold back into their native forms in the host cell cytoplasm. Researchers not only solved the 3D structure of PTEX, but also found a small segment of peptide trapped in the channel, indicating that proteins are indeed â€œsqueezedâ€ through it.Â Proteins are transported across the cell membrane in sacks of air, called vesicles. Vesicles are made of a phospho-lipid bi-layer, the same structure that make sup the cell membrane.