which deals with the effect of osmotic pressure, solute concentration, and gravitational-force fields on the escaping tendency. The chapter concludes with a discussion of surface free energy which considers force fields generally, and the special cases of capillaries and the tensile strength of water. The second chapter deals first with general principles of water and solute transport and then with phenomena involving interdiffusion, discrimination between water and solute, and movement of water vapor. Special consideration is given to water movement, as related to pressure differences, across systems such as simple membranes and to the problems of composite porous membranes and liquid membranes. The influence of electrical potential gradients and temperature gradients is also considered. The remaining chapters deal with movement into, within, and out of the plant. Consideration is given first to intercellular water movement, extracellular movement, and movement within tissues. Water movement into the root, from leaf to air, and through the soil-plant-atmosphere system is then discussed.

Although the book is short, it contains many valuable ideas and much important information. The approach is that of the physical chemist and biophysicist, but the treatment is such that it should be readily understood by the physiologist or ecologist interested in water-transport phenomena. I regard it as an important and very useful addition to the literature.

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Routes to the Organelle

Enzyme Cytology. D. B. RODYN, Ed. Academic Press, New York, 1967. 607 pp., illus. $25.

For many years cytologists have trudged down pathways into the fertile valley of the cell organelles. Nowadays, investigators, mainly biochemists, traverse a superhighway into the same valley and, while the two routes converge at points, much still depends on the position of the observer and his lingo. Although it is positively ecumenical for a morphologist to refer to $NADH_2$ cytochrome *c* reductase and a biochemist to unit membranes, sometimes they don't speak the language so good.

What comes out for this reader is a sense of ambivalence in this multi-authored book, which includes the following chapters: General Principles; The Nucleus; The Mitochondrion; The Chloroplast; Lysosomes, Phagosomes, and Related Particles; Membrane Systems; Ribosomal Enzymes; and The Soluble Phase of the Cell (which does not have a cytological counterpart). Many aspects of most chapters are well put together. As reviews the chapters are relatively up-to-date and worthwhile collections of integrated information for interested graduate students and for scientific workers whose commitment is peripheral to the field covered by each of the individual chapters. However, I found parts of some chapters within my ken somewhat biased, even incorrect, and repetitious of what has been recently, and better, said elsewhere. As a collection of information concerning enzymology and cytology, the papers appear to slight one or the other of these disciplines, most often the cytological one, and the inclusion of several electron micrographs doesn't correct the deficiency. Although some chapters include significant advances made by cytochemical staining techniques, others ignore this area.

The notion of bringing together information from electron microscopy and from studies on fractions isolated from cell homogenates is good. Too often, however, the information available to the reviewer comes from one field or the other, and it is our (the workers') fault that an adequate "hybrid" (De Duve) state is lacking in some of the information presented. For the moment in this young field, we're stuck with the fact that for years some morphologists have described structure and speculated on function; recently, some biochemists show some preoccupation with the reverse. As a result, a large part of this book would have been better named "Cytological Enzymology."

Thus, I found this volume partly well done, informative but quixotic because sometimes it creaks like rusty armor when facing information situations that are less definitive and more like windmills. Although it is really not too early to get down to vital information in this exciting and growing field, the book in part views the same crossroads through other peepholes, and I wonder how many views of the crossroads have already been recorded by the same publisher. From another viewpoint, the purpose of "sweeping yon clouds from the sky" by combining information of cytology and enzymology is a good one. However, our students who are being trained to think and do in both disciplines may adopt an attitude, concerning parts of this volume, more like that of Sancho Panza.

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The Space Agency as Manager

An Administrative History of NASA, 1958–1963. ROBERT L. ROSHOLT. National Aeronautics and Space Administration, Washington, D.C., 1966. 399 pp., illus. Available from the Government Printing Office, $4.

Our space program has had administrative problems unprecedented in kind and magnitude. NASA administrators have had to innovate in solving such problems as the coordination of the production schedules of thousands of industrial contractors and the allocation of enormous public resources within NASA and among the competing contractors. Other problems have included the creation of an institutional framework within which engineers and scientists would flourish, the maintenance of constructive relations with the Department of Defense, and inspiring the confidence of Congress and the public. NASA, since 1958, has been on the frontier of administering big technology within a complicated context of public financing and private enterprise.

Passage of the National Aeronautics and Space Act of 1958 provided the framework for future administration. The Space Act was the entrepreneurial decision that determined that the nation's space program would be under the jurisdiction of several agencies, with NASA responsible for civilian activities and the Department of Defense for military. It also established that "over-all policy direction" would come from a council chaired by the President (later by the Vice President), and that "Congressional oversight" would be carried on by two new standing committees. It was also assumed from