

Biological Program's *Project Aqua*, was the only known locality of several species of plants, crustaceans, insects, and fish. I follow P. J. Darlington, Lars Brundin, and the editor of this volume in noting that the time left for the exploration of these antipodean biotas is short. Williams and his collaborators are to be commended for bringing the importance of the Tasmanian biota to the attention of the scientific community. Perhaps as the public learns more of its significance its conservation will be given higher priority.

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Aftermaths of Brain Lesions

Plasticity and Recovery of Function in the Central Nervous System. Proceedings of a conference, Worcester, Mass., Sept. 1973. DONALD G. STEIN, JEFFREY J. ROSEN, and NELSON BUTTERS, Eds. Academic Press, New York, 1974. xii, 516 pp., illus. \$19.50.

The study of recovery of function following brain lesions is an old endeavor, dating back at least to the last century. The field has been plagued by the problem of defining exactly what it is that is recovering: is the brain correcting for damage done to its various parts and their dependents, or does the animal simply learn new ways to do old tricks? While the arguments continue, this problem has yet to be satisfactorily resolved, in part because the larger question of how behavioral functions are localized in the brain goes unanswered. If, as some suggest, the brain should be viewed as an incredible network with little discrete parcellation of function, the idea that lost tissue is replaced by adjustments elsewhere in the system becomes tenable. This view of brain organization has failed to gain many adherents, however. Most scientists believe that brain regions are unique and specialized, and most tend to see recovery phenomena as examples of the ability of the organism to operate without the contributions of the damaged area.

Possibly because these basic issues continue unresolved, recovery of function has remained more of concern to the clinician than to the laboratory worker. Recent developments in neurobiology, however, have revitalized interest in the subject. Specifically, sub-

stantial evidence has been reported indicating that lesions cause exotic anatomical and chemical changes, some of which seem to be excellent candidates for a mechanism to explain at least some aspects of the recovery phenomenon. The book under review is the result of a conference at which a group of workers studying recovery were brought together with researchers investigating the brain's capacities for reorganization, that is, "brain plasticity."

As would be expected, much of the book is taken up with reports from the laboratory and clinic on recovery following damage to the mature central nervous system. By reading this section a reader can quickly come to an understanding of the experimental approaches and principal neurobehavioral findings of workers in this area. This useful collection is highlighted by a superb paper by Goldberger describing work in which he used lesions in the different subdivisions of the brain's motor systems to test various descriptive hypotheses about the nature of the recovery process. The advantages gained by using lesions in anatomically defined systems and studying their effects on relatively simple behaviors are so well demonstrated by this review that one wonders why the practice is not more widely followed.

In striking contrast to the extended list of behavioral papers on the recovery process, there is very little in the book on the neuroanatomical and biochemical changes initiated by the lesions. This is all the more surprising in view of the frequent reference made in the behavioral chapters to studies of such phenomena as axon sprouting and denervation supersensitivity as possible or even likely mechanisms to account for recovery. R. Y. Moore does give us a level-headed appraisal of post-lesion growth by the catecholamine system, but the remainder of the work that has been done on lesions and brain plasticity is not reviewed anywhere in the book. In short, the book is unbalanced and in a sense fails to live up to its title.

The volume also contains three interesting papers on the behavioral and anatomical consequences of lesions in the immature nervous system. Schneider and Jhaveri's account is particularly fascinating because they have attempted with some success to correlate their descriptions of axon sprouting, or perhaps altered growth in developing fiber systems, with behavioral changes.

As in the chapter by Goldberger, the advantages of selecting an anatomical system appropriate for the question being asked are well illustrated by Schneider and Jhaveri's review. The chapter by Brunner and Altman and that by Goldman not only describe some interesting findings but also provide useful discussions of the experimental and theoretical issues attendant on work with neonatal animals.

There are also two papers (Meyer and Sperry; Jacobson) on the development of the retinotectal connections in fish and amphibians. What relationship these bear to the theme of the book is left for the reader to decide, but the papers stand by themselves as sharply analytical reviews.

The book is opened by an informative and entertaining history by Rosner of the study of recovery and localization of function. This chapter should be read by anyone venturing into either of these areas.

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Membrane Methods

Evolving Strategies and Tactics in Membrane Research. DONALD F. H. WALLACH and RICHARD J. WINZLER. Springer-Verlag, New York, 1974. x, 382 pp., illus. \$29.80.

This book deals with two basic problems of contemporary membrane research. The first two chapters describe membrane isolation techniques and methods for separating and identifying membrane components, and the remainder of the book deals with spectroscopic techniques that are being used to study natural membranes and artificial lipid bilayers. The book is very readable. Rather than presenting a series of highly detailed accounts of membrane techniques, the authors outline the strategy and the theoretical basis of each technique and describe it briefly, providing references for actual bench work. The first two chapters alone are probably worth the price of the book, especially to the neophyte in membrane research.

In chapter 1 the hazards of extrapolating data obtained from isolated membrane fragments to the *in situ* situation in the whole cell are well expounded. It is refreshing to read an integrated discussion of centrifugation techniques, membrane enzyme markers, covalent