as the others. Finally, in seeking to stimulate the reader's interest in his work Pearlin comes close to setting up a straw man. Far from being uncommon, which is the impression he gives, there is a substantial accumulation of published research on how life outside the family affects life inside the family. We have several studies, for example, on how economic depression and the unemployment of men influence the inner life of the family. Surely this kind of experience would with a little imagination qualify as a type of "unsatisfactory working condition" and help to enrich the author's understanding of the pattern he considers a salient feature of his book.

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Handicapped Children

Education, Health and Behaviour. Psychological and Medical Study of Childhood Development. MICHAEL RUTTER, JACK TIZARD, and KINGSLEY WHITMORE, Eds. Wiley, New York, 1971. xiv, 474 pp. $9.75.

Subject matter for considerably more than one volume is contained within this book, which reports the findings of a series of surveys conducted in 1964 and 1965 to ascertain the prevalence of intellectual retardation, educational backwardness, physical disability, and psychiatric disability among the 9-to-12-year-old children living on the Isle of Wight. A second main feature of the study is an analysis of differences of various kinds between the children identified as handicapped and a randomly selected control population. The book is organized not by these features, however, but according to the individual handicaps studied, with the result that the overall presentation is somewhat confused and redundant.

The plan of the prevalence study is straightforward. Methods were developed for the overall screening of the population, and cut-off criteria for the possible presence of handicap were established. Individual examinations were then conducted on children so identified to determine the actual presence or absence of disorder. The findings on individual examination, as well as a series of cross-checks which were made throughout the data, permitted the making of some fairly sound estimates of both Type I and Type II errors, with the result that one child in six was considered to have a chronic handicap of moderate or severe intensity.

The operational criteria for each type of disorder examined, the survey instruments, and the techniques of individual assessment are precisely described. Moreover, the appendix contains a full discussion of the difficulties encountered by the team in the actual execution of the study. These factors are of considerable importance to those concerned with replication—and the issue of the necessity of replication arises strongly when the study is considered critically. Although the Isle of Wight, because of its sophisticated facilities and its well-defined geography, is an epidemiologist's paradise, it is, as the authors themselves point out, a most atypical community. Its generally high standard of living, the better-than-average intellectual level of its children, and the absence from it of large urban centers limit the generalizability of the findings to other areas in Britain, to say nothing of other countries. The authors argue persuasively that intensive local studies to assess local conditions are prerequisite for the sound planning of services, and suggest that their study be considered as a model and a prototype. The time, effort, and expense involved in extensively generating data that have little more than local applicability approach a prohibitive level, however, and suggest that other ways of rationalizing the planning of services for the handicapped must be sought. This is a problem to which the authors devote little attention. Moreover, their discussion of the applicability of their findings to the improvement of health services on the Isle of Wight itself is scanty and superficial.

However, the data of the surveys make up only a small portion of the book. By far the largest sections are devoted to a comparison of the individually determined characteristics of the children identified as intellectually, educationally, physically, and emotionally handicapped with those of a control sample who were also individually examined. The randomly selected control group contains a certain proportion of children who were also identified by the screening instruments as requiring individual examination. The authors argue that the inclusion of such children in the control group need not be of concern because it can only result in an underestimate of differences. But they overlook a much more important consideration in the use of a randomly selected control group, which is that the children with disability are being compared with children who reflect the social structure of the entire community rather than of the disabled children themselves. Since many, if not all, of the disorders investigated have a social class distribution, it is difficult to determine in the absence of social class controls the extent to which differences between the groups with respect to such factors as family size, ordinal position, neurologic impairment, developmental deviation, and the like are associated with the disorders, not just with social class. The use of a stratified control sample would have obviated these difficulties, and the degree of stratification required would have provided a measure of the social class distribution of the handicaps under investigation.

Education, Health and Behaviour contains a wealth of background information on handicaps in children which is carefully presented, thoughtfully discussed, and extensively documented. These features commend it, despite stylistic and methodologic weaknesses, as an extremely useful reference volume, to educators, psychologists, physicians, and all others who have as their primary charge the welfare of children.

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Nuclear Body

The Nucleolus. HARRIS BUSCH and KAREL SMETANA. Academic Press, New York, 1970. xviii, 626 pp., illus. $29.50.

This volume offers an encyclopedic mass of facts dealing with the nucleolus. The facts are well presented. Details are easily found. An unusual feature of the book is that so much of the experimental material, whether obtained in the electron microscope or by biochemical techniques, comes from the authors' laboratory. The work carried out by this group is so extensive and has so many aspects that one can only marvel at the determination (and the material facilities) that made it possible.

This work coupled with a thorough review of the literature yields a wealth of information on the nucleolus. The presentation of the facts is facilitated

by numerous tables. Many good photographs are also included. Another useful device is the summary found at the end of most of the chapters.

It is difficult to keep an encyclopedia readable throughout. This is particularly the case when it is written by cautious individuals. The authors only touch on controversial subjects. For instance, the problem of whether or not there is protein synthesis within the nucleolus is not discussed in depth; and the experiments placing labeled amino acids in contact with giant chromosomes and their nucleoli are not even mentioned. More generally, there is a definite reluctance on the part of the authors to draw broad biological conclusions from their abundant material. Some would praise their restraint. Others would regret it, if only because a few flights of imagination would have enlivened the book. Should not one marvel at the ubiquitous presence of the nucleolus in plant and animal cells, and at the uniformity of its structure in all? Is it not exciting to think of the continuous production by the nucleolus of the building stones of ribosomes in all living cells, with the correlate of continuous protein synthesis? These and other majestic conclusions may be extracted from the book, but the reader has to do it himself.

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Adaptive Immunity

Antigens, Lymphoid Cells, and the Immune Response. G. J. V. NOSSAL and G. L. ADA. Academic Press, New York, 1971. xx, 324 pp., illus. $17.50. Immunology series.

A problem frequently ignored in general reviews which consider the mechanism of adaptive immunity in higher organisms concerns the elaborate mechanisms that affect the distribution, deposition, storage, catabolism, and disposal of alien antigenic material accidentally or deliberately introduced into the animal. These factors unquestionably influence the subsequent development of the immune response. The general question "How does antigen work in the immune response mechanism?" has constituted the dominant theme of research in Nossal's and Ada's laboratories over the past several years.

The stated purpose of this book is to present the current view of the manner in which antigens provoke the onset of an immune response, of the nature and properties of substances which qualify them as immunogens, and of the cell physiology of the mammalian lymphoid system which participates in the response to antigen. Rather than an overview of the cellular basis of immunity, which the title might lead one to expect, the authors have produced a general summary, in a technical but highly readable form, of their conceptions of the early events related to the fate of antigen in vivo, its interaction with the various cellular components of the immune response mechanism, and the confrontation between antigen molecules and competent lymphocytes which leads to immunity or to tolerance.

In their consideration of the fate of antigen in vivo, the authors start with the assumption that the humoral antibody response mechanism was designed through evolution so that the vertebrate species could cope more effectively with bacterial and viral pathogens. The development of their arguments is then influenced by two important considerations: that scavenger cell systems phylogeneti cally antedate adaptive immunity, and that humoral immunity constitutes a subsequent elaboration of the more primitive capacity for cell-mediated immunity. Thus the processes for the nonimmunologic disposal of alien material have evolved over a longer period of time than the means by which such material stimulates lymphocytes to produce antibody. The fate of antigen in a higher organism is therefore controlled by remnants of these three protective mechanisms, and possibly by others as well, such as those involving interferon. Systematic study of this question is consequently rendered more difficult.

In support of their concepts, the authors rely heavily on their own and their colleagues' studies. Other views are not always fully represented, and the results of experiments performed by others which best illustrate a point under discussion are sometimes ignored in favor of the local product. This should not be considered a serious criticism of the work, however, for this bias represents something of a blessing as well. Because they have contributed so extensively to this particular area of immunology and have, perhaps more clearly than others, defined the problems and pitfalls inherent in studies of antigen distribution in the intact organism, a synthesis of their views and a summary of their research activities should be of great value.

This book is well indexed both by subject and by author, contains a rather complete bibliography, and is illustrated with tables, diagrams, and photographs. The appendix includes a "cookbook" section on the preparation of flagellar antigens from *Salmonella* organisms and on the technique of electron microscopic radioautography and the properties of radioisotopes commonly used therein, procedures which the authors have used extensively and which they have developed to a high degree of refinement.

The lucid and thorough discussion of this rather difficult area of immunology will undoubtedly make the book one of the more valuable ones both in classrooms and in laboratories of immunology.

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Effects of Light

Photobiology of Microorganisms. PER HALLDAL, Ed. Wiley-Interscience, New York, 1971. xii, 480 pp., illus. $19.50.

With the Sixth International Congress on Photobiology on the horizon (Bochum, Germany, August 1972), it is appropriate that this book should appear; indeed, it has been long anticipated, since manuscripts were being prepared at the time of the Fifth Congress in 1968.

First for what the book is not. As Halldal points out in his preface, photobiology is a diverse field, and he has limited the book to microorganisms (though not just unicells), thereby excluding such aspects as vision and photodermatology. Furthermore, the approach being primarily biological, photochemistry and photodynamic action are not considered. Finally, several topics in microbial photobiology are not directly dealt with, or are dealt with only in part: photosynthesis (of microalgae and bacteria) is allotted only two chapters because "it has recently been covered extensively in several books," and the physiological effects of far ultraviolet (photoinactivation and photoreactivation, lesions and mutagenesis, and repair) are not specifically treated because of their "marked chemical and biophysical character." Although I feel