final chapters set the stage for the volume that follows by elucidating the mechanisms of mutational events as they affect chromosome number and structure. The appendixes to volume 1 are valuable in that they include detailed techniques of cell culture and chromosome preparation, as well as the reports of the Denver (1960), London (1963), and Chicago (1966) conferences on standardization of the nomenclature in human cytogenetics.

In volume 2, Hamerton brings his own experience, and that of Polani's group at Guy's Hospital in London, to discussions of autosomal and sex chromosomal abnormalities. This volume is most informative in its treatment of the latter group of disorders, though the author might well have spared us the at times excessive enumeration of the clinical manifestations and cytogenetic findings in too many cases of sex chromosomal and autosomal disorders. Nonetheless, this cataloging is useful from a reference point of view. Despite the occasional weight of detail, the syntheses come through clearly, and the author's discussion of the chromosomal determination of sex, in man and other mammals, is particularly valuable.

Unfortunately, the last chapters of this volume, the cytogenetics of pregnancy wastage and of neoplasia, seem somewhat artificial. The author might have done better to incorporate the discussion of abortuses into his discussions of sex chromosomal and autosomal abnormalities. The excellent studies now published on fetal wastage seem so relevant to our understanding of the trisomy and X-monosomy conditions, in particular, that it is a pity he elected to review these studies separately. The chapter on chromosomes and cancer is an adequate review of the subject, but it is more or less unintegrated into the basic structure of the volume, and seems to this reviewer to have been an unnecessary addition.

The figures of meiotic and mitotic chromosomes are generally excellent, adding a sense of the esthetics inherent in this discipline when it is properly pursued. The bibliography is extensive and valuable as a source of original and review papers.

One is tempted to regret that the newer techniques of fluorescence and heterochromatin staining (to produce specific banding patterns of human chromosomes) were not available until after publication of Hamerton's volumes. These techniques will greatly increase our knowledge of the extent and meaning of chromosomal variation in human populations. However, it will likely be several years before the biological basis of these staining techniques is understood, and perhaps even longer before their widespread use clarifies fully their value and limitations. Hamerton's two-volume work will stand, then, for quite some time as the definitive text in the field.

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Transplants and Hosts

The Immunobiology of Transplantation. RUPERT BILLINGHAM and WILLYS SILVERS. Prentice-Hall, Englewood Cliffs, N.J., 1971. xiv, 210 pp., illus. Cloth, $9.75; paper, $4.95. Prentice-Hall Foundations of Immunology Series.

A survey of problems in transplantation, meant for reading by biologists, is a welcome addition to existing books in the field. Billingham and Silvers have produced the best general account of transplantation that I know, and have let the account range from genetics to surgery without losing its form as a work about biology. Their experience in most of the areas covered in the book means that a reader is favored by a single view of transplantation, and this single view eases his way into the subject.

Throughout, clinical and experimental materials are woven together most skillfully. The chapters on the genetics of histocompatibility begin with the history of transplantation and move through a description of animal systems, especially the mouse, to a chapter on human histocompatibility genetics. Progress in this field is succinctly but clearly described, together with the usefulness of typing in organ transplantation. Again, in the chapter discussing immunologically privileged sites for transplantation and the special properties of some tissue and organ grafts, a happy mixture is found of animal experiments and clinical results. Succeeding chapters on tolerance and the reaction of graft versus host deal with some classic aspects of experimental transplantation, neither of which, fortunately in the latter instance, has been much applied in clinical practice. Chapters on pregnancy as a problem in homografting and on immunosuppression in man-made graft systems conclude the book. Throughout, as many problems are raised as solid strong statements of fact are made. The statement "we don't know" recurs, emphasizing the complexity that has been brought to order in this book and the continuing advances in the field.

A short but useful list of older references, stressing reviews, is given for each chapter. Read with the book, the reviews should readily allow students to get a solid grounding in transplantation. To then extend their knowledge to the very recent literature might be somewhat more difficult. Many recent experiments are cited, but only the authors' names are given rather than complete references, and tracing the articles might take a few minutes with an index or two. Still, this device allows access to the literature without encumbering the book by enormous reference lists.

The use of the book as an introduction has been experimentally tested in my own laboratory. It has been impossible to lay hands on the review copy for the past few months, as several new students, coming into immunology from biochemistry, have given themselves quick and useful introductions to the field by means of it. This book is an auspicious start to its series: monographs on basic topics in immunology for a diverse audience.

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Geological System

Cambrian of the New World. C. H. HOLLAND, Ed. Wiley-Interscience, New York, 1971. viii, 454 pp. + plates. $29. Lower Palaeozoic Rocks of the World, vol. 1.

Rocks of the Cambrian System represent a time span of perhaps as much as 100 million years. The physical limits of the system are not defined in the present volume, biostratigraphic and philosophical argument being deferred to a later book in the series. Despite the lack of precise definition, the continents of the New World display a great array of acknowledgedly Cambrian rocks at and below the surface of a vast area. Effective treatment and analysis in this single volume result from a combination of skillful authorship and the nature of the preserved Cambrian record. A. S. Palmer, in cov-

ering the Cordilleran and Appalachian cratonic margins within the United States, sets the scene by identifying three irregularly concentric facies belts: an inner detrital belt of quartz sandstones derived from the cratonic interior (largely from the Canadian Shield), a carbonate belt of shifting Bahama-like banks, and an outer detrital belt representing silt and clay bypassed to deeper and less agitated bottoms seaward of the banks (perhaps on the continental slope and rise). Forthcoming volumes on younger systems will have to cope with the structural, igneous, metamorphic, and stratigraphic complexities of mobile belts active at continent-ocean interfaces. Mercifully, such "eugeosynclinal" problems are largely unrecognized in the Cambrian record, in part because of pervasive overprint of younger events and in part because stratigraphers tend to correlate unfossiliferous chert-turbidite successions with similar rocks bearing Ordovician graptolites. An exception to the rule of continental margin obscurity, masterfully treated by F. K. North, is found in the Maritime Provinces. South America, in common with many Gondwana areas, has a minimal Cambrian cratonic-interior record; preservation is largely confined to the western border of the carbonate belt and its passage into the outer detrital belt in the Cordillera Oriental. The widespread Cambrian lacuna makes it possible for A. V. Borrello to present an adequate summary of current knowledge of the system in South America in a fraction of the space required for North American coverage.

It is obvious that Holland has not employed a heavy editorial hand in coordinating matters of concept or style. In coverage of the United States, Palmer relies primarily on verbal descriptions of discrete areas (one could wish for greater resort to tabulation of descriptive matter) whereas Lochman-Balk uses a wealth of graphics to describe and interpret the cratonic interior (and a breezy, Runyonesque present tense for ancient events). The two authors agree on the systematic cyclicity of Cambrian sedimentation but invoke eustatics rather than tectonism as the controlling factor. North covers an immense area of Canada and achieves a fine balance of useful detail and interpretation. He sees significant evidence of cratonic and craton-border tectonism and igneous activity; reconsideration of Cambrian stability in the United States seems indicated. J. W. Cowie, writing on the Canadian Arctic and Greenland in advance of the acquisition and release of a large volume of critical data, is able to show that the northern continental border fits moderately well into the model developed in lower latitudes. Major enigmas, such as are posed by the East Greenland fold belt, continue to await resolution, but, as throughout this volume, readers can gain a nearly current overview of the state of knowledge along with some fascinating nuggets of speculation.

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Organometallic Catalysts

The Organic Chemistry of Palladium. PETER M. MAITLIS. 2 vols. Vol. 1, Metal Complexes. xvi, 320 pp., illus. $19. Vol. 2, Catalytic Reactions. xvi, 216 pp., illus. $16. Academic Press, New York, 1971. Organometallic Chemistry.

The catalysis of organic chemical reactions by derivatives of transition metals is a subject of enormous practical importance: these catalysts provide the basis for the processes used in the large-scale commercial synthesis of many basic chemicals. They are, however, less widely used in small-scale organic synthesis, in major part because their successful application requires a feeling for the characteristics peculiar to each metal ion and a working familiarity with a voluminous and poorly organized patent literature, neither of which is common among synthetic chemists. These volumes review the catalytic properties of palladium, one of the presently and potentially most useful of the transition metals.

The first volume is a very successful discussion of the structural characteristics and reactivity of complexes of palladium. It contains enough introductory and elementary material that it should be easily comprehensible to anyone with a moderate knowledge of organic chemistry. At the same time the topics discussed are sufficiently generally pertinent to the organometallic chemistry of the late transition metals that this volume could serve as a self-contained introductory textbook to this type of chemistry. The second volume is concerned with reactions in which derivatives of palladium act as catalysts. It is organized usefully by reaction types (for example, reactions involving formation and cleavage of bonds between carbon and carbon, oxygen, hydrogen, and heteroatoms), and its coverage of the literature is sufficiently thorough that it should make the great number of synthetic methods based on palladium accessible to synthetic chemists with no particular expertise in organometallic catalysis. The discussions of reaction mechanisms included in this volume are a trifle credulous and sometimes fragmented, but the important descriptive chemistry is readily available. Both books contain instructive comparisons between the characteristics of palladium and those of the isoelectronic (and also catalytically active) derivatives of platinum and nickel.

These volumes provide the best available discussion of the catalytic properties and organometallic chemistry of palladium. They should be of use both as reference collections to chemists interested in applying organometallic catalysis in organic synthesis and as a thorough and readable introduction to the chemical principles underlying an important and representative kind of catalysis.

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Advances in Applied Microbiology. Vol. 14. D. Perlman, Ed. Academic Press, New York, 1971. xiv, 414 pp., illus. $21.50.

Advances in Atomic and Molecular Physics. Vol. 7. D. R. Bates and Immanuel Esterman, Eds. Academic Press, New York, 1971. xvi, 406 pp., illus. $22.

Advances in Carbohydrate Chemistry and Biochemistry. Vol. 26. R. Stuart Tipson and Derek Horton, Eds. Academic Press, New York, 1971. xii, 550 pp., illus. $26.

Advances in Clinical Chemistry. Vol. 14. Oscar Bodansky and A. L. Latner, Eds. Academic Press, New York, 1971. xii, 500 pp., illus. $22.50.

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Advances in Immunology. Vol. 14. F. J. Dixon and Henry G. Kunkel, Eds. Academic Press, New York, 1971. xx, 378 pp., illus. $18.50.

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