the infected cell, instead of relying on "borrowed" cell enzymes for replication.

Following the lucid chapter, "The bacteriophage model," by William Hayes, there is a systematic and comprehensive chapter, by A. W. Downie, entitled "Pathways of virus infection." The routes by which a virus enters into the host body, spreads within the host, and is released from the host are reviewed. There follows a series of three chapters on mechanisms of cell infection. In the first chapter, "Virus attachment and penetration," by A. Cohen, the complexity underlying the seemingly simple phenomenon of virus adsorption is clearly brought out. The discussion of penetration would have been considerably more advanced if Cohen had been able to use more of the information published in 1961 and later. Alick Isaacs' chapter, "Intracellular virus replication," provides a picture of the biochemical events in virus reproduction. Considerable evidence is presented indicating that the formation of viral nucleic acid and the formation of viral proteins are separate events. D. A. J. Tyrrell's chapter, "Virus release," covers, in a general way, not only the release phenomenon itself but also viral growth curves, the intracellular localization of virus multiplication, and the techniques used to study viral growth and release. Mention is made of some of the findings with certain tumor viruses.

In the chapter "Virus pathogenicity," J. C. N. Westwood brings together much of the pertinent information that bears on the pathogenesis of poliomyelitis and poxvirus infections. The section on virus toxicity emphasizes the important fact that an incomplete or abortive cycle of multiplication may result in the degeneration and death of host cells without the production of infective virus. Such incomplete cycles have been observed in a variety of experimental systems. However, as Westwood points out, disease develops in a host organism only if there is successive involvement of an increasing number of cells, which depends on the production of infective virus.

The concluding chapter, by B. Belyavin, is entitled "Virus adaptability and host resistance." The ability of a virus to negotiate both intrahost and interhost pathways is taken as a measure of its "adaptation." Resistance of the host system is defined in terms of the sum total of the barriers that must be overcome. A thoughtful discussion of virus-host equilibria is presented. The final section is on the fascinating subject of antigenic variation among influenza viruses. There is a fairly detailed discussion of the possible epidemiological significance of the so-called "Q-phase" variants which are characterized by low sensitivity to antibody, but the nature of the variants is not indicated. No reference is made to the important fact that the so-called "phase variation" is due to fluctuation from strain to strain in the proportions of two kinds of genetically distinct virus particles, which differ in their sensitivity to antibody and inhibitors.

I received the review copy of this volume in October 1963. [The review copy was received from the publisher on 26 September. Ed.] A glance at the bibliography reveals that there are few references to papers published in 1961 and only rare ones to papers published in 1962. This raises the question as to whether any chapter on a subject in which progress is extraordinarily rapid can be up to date in such a book as this. The most rapidly moving fields are perhaps best summarized in individual review articles or in promptly published symposium papers. Another shortcoming of the present volume is that it contains little information about tumor viruses.

This book does present a well-balanced view of cytocidal virus infections. There is no doubt that it will be read with interest and profit by many virologists as well as by scholars and experts in other fields. Students of medicine and physicians should find that it provides a broad understanding of many of the fundamental aspects of virus-cell interaction.

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Salmon Politics

Politics and Conservation: The Decline of the Alaska Salmon. Richard A. Cooley. Harper and Row, New York, 1963. xxii + 230 pp. Illus. $5.

The commercial salmon pack in Alaska reached important proportions shortly after the turn of this century and following a quick buildup, became the major Alaskan industry for the next 50 years. Despite its prominence as a resource, and despite the recurrent waves of conservation enthusiasm that engulfed this country from time to time, it proved impossible for the government of the United States effectively to regulate the fishery. According to the author of this book, the salmon runs of Alaska have been essentially destroyed by overfishing. His book is a meticulously documented history of the demise of the fishery and of the politics that underlay the inadequate regulatory processes.

For 10 years the author, Richard A. Cooley, has lived in Juneau, where he serves as director of the Alaska Natural Resources Center, operated by the Conservation Foundation. He is obviously a scholar, well-versed in the skills of sifting the historical documents available in the capital city. He traces the development of the federal conservation program through written records ". . . found in Congressional hearings, committee reports, the *Congressional Record*, official reports of government agencies, enacted laws and policy statements, newspapers and trade journals, and the writings, addresses, letters and reports of persons and organizations involved in the policy-formulating process." Recounting the play-by-play sequence of salmon politics, Cooley skillfully leads the reader through an account of the long sordid history of repeated frustration of conservation efforts by a strong well-organized lobby of packers, working in conjunction with a weak and sometimes disorganized federal administration. In so doing, the author clearly expresses his own prejudices and feelings toward individuals or groups that he considers culpable. But basically he brings out a more significant point, namely, that in a free and competitive fishery, the ordinary democratic processes of regulation by limiting seasons and gear cannot adequately protect a vulnerable breeding stock. "Whatever the individual canner spared for spawning purposes, his competitors would thankfully accept and place in cans." In this pattern of ruthless competition, the fishing interests unremittingly kept canning salmon until they had destroyed their own livelihood.

Administration of the salmon fishery —such as remained of it—passed from federal jurisdiction to the State of Alaska in 1959. In the introduction to this book, Senator Ernest Gruening castigates the past federal administration and implies that things will be better under statehood. The author, however, takes a more cautious view. In his terminal chapter he reviews the

economic, political, social, and biological problems inherent in regulating the salmon fishery and notes that none of these were resolved by the simple device of transferring jurisdiction. The underlying pattern of cutthroat competition in the free and open fishery is unchanged. It remains to be proven that the new state government can cope with the situation better than the federal bureau. In any event, this clearly written volume will provide everyone involved with a much better perspective of the problem.

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Comprehensive Resume

Tektites. John A. O'Keefe, Ed. University of Chicago Press, Chicago, 1963. xii + 228 pp. Illus. $10.95.

Tektites, small glassy objects that are found in limited regions on Earth under circumstances which preclude a volcanic origin, have intrigued those scientists who have examined them carefully, ever since they were first mentioned (1788, from Bohemia) in scientific literature. However, until about 10 years ago, these scientists were comparatively few in number, and much of the earlier literature is widely scattered and not easily accessible. The great upswing in meteorite research in the postwar years attracted more general interest in tektites, and the suggestion that they may represent lunar material has provided a further stimulus to their intensive investigation. As a result a tremendous amount of new data has become available. These data, and the deductions that can be drawn therefrom, are admirably presented in this book. It consists of the following nine chapters: "Form and sculpture of tektites," by George Baker (24 pp.); "Tektite strewn-fields," by Virgil E. Barnes (26 pp.); "The petrographic and chemical characteristics of tektites," by E. C. T. Chao (44 pp.); "The chemical composition of tektites," by C. C. Schnetzler and W. H. Pinson, Jr. (35 pp.); "The physical properties and gas content of tektites," by Irving Friedman (7 pp.); "Isotopes in tektites," by J. Zähringer (13 pp.); "Aerodynamic analysis of tektites and their hypothetical parent bodies," by Ernest W. Adams (17 pp.); "The origin of tektites," by John A. O'Keefe (22 pp.); "Asteroid—or comet—impact hypothesis of tektite origin: the moldavite strewnfields," by Alvin J. Cohen (24 pp.).

The authors are all men who have been in the forefront of tektite research, and John O'Keefe deserves congratulations and thanks for having persuaded them to join with him in preparing this book, which fills a real need. All the papers are thoroughly up-to-date, with references as late as 1962, and a tremendous amount of new information, particularly on the chemical composition—major, minor, and trace elements—is presented. With all this new information, however, the basic question—"Are tektites meteorites?" or perhaps more carefully stated "Are tektites of terrestrial or of extraterrestrial origin?"—remains a matter of opinion and controversy. However, the possibilities appear to have been narrowed to an origin by meteorite splash from the lunar surface or to one by asteroid or comet impact on the Earth's surface. A refreshing feature is the careful separation of fact from deduction and hypothesis and the absence of dogmatism. Although individual authors usually favor one or the other of the above possibilities, they present their data fairly and do not minimize the unsolved problems that remain. This book is an outstanding synthesis of our present knowledge of tektites, and it should be a stimulus to further investigations on these remarkable and enigmatic bodies.

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Mitosis

The Cell in Mitosis. Proceedings of the symposium held under the provisions of the Wayne State Fund Research Recognition Award (Detroit, Michigan), November 1961. Laurence Levine, Ed. Academic Press, New York, 1963. xii + 274 pp. Illus. $10.

This is one more incarnation of one more symposium on a popular topic—mitosis. To invoke those standards of judgment which should be applied to a *book* would be unfair to the editor and the contributors; fully to ignore those standards would be unfair to prospective readers. My dilemma is a familiar one, and my easiest out is to say that this particular volume matches the quality of a number of others which have been published in the past two years. The topic is necessarily diffuse and almost impossible to deal with both comprehensively and pithily. Any symposium organizer who manages to achieve a pattern of discussion different from that of the preceding symposia on the same topic is to be congratulated; this much Levine has achieved.

Although the book contains discussions on both structural and metabolic features of mitosis, the weight of emphasis is in favor of the structural ones. A venerable and classical topic, the centriole, is discussed lengthily by Cleveland and Burke. The fine structure of the cleavage furrow is treated briefly by Buck. Rehbun roams extensively about the subject of cytoplasmic particle movements and their possible significance in interpreting mechanical work performed by the endoplasmic reticulum which, in turn, could possibly be related to polar movements in mitosis. Elliott interrupts the sequence of generalized titles with a contribution on the fine structure of *Tetrahymena* during mitosis, but his article together with Ray's discussion of it are as broad in their target as the others. Zimmerman effectively summarizes chemical analyses of the isolated mitotic apparatus, supplemental information being supplied by Rustad in his discussion. Bloch discusses a now popular topic, the regulatory functions of histones; his discussion, though pertinent to mitosis, is framed in the general context of genetic regulation. Andrew Szent-Gyorgi analyzes the problem of contractility; he correctly makes no effort to center his analysis on mitosis but restricts himself to the much better studied phenomenon of muscle behavior. Two articles are addressed to metabolic problems. Scherbaum sets forth the chemical prerequisites for division based on studies of *Tetrahymena*, and the discussant, Gelfant, initiates a discussion that leads to some questions about the validity of this organism as a general model. Wilson covers the work of his group on the action of antimitotic agents, and Biesele rounds out the presentation with a broad discussion of Wilson's findings.

A reader who turned to this book for a general knowledge of mitosis would, of course, be disappointed. So too would one who sought for a deep analysis of all the major problems underlying mitosis. I prefer to assume,