have lacked finesse at points. For example, the book dates the first Soviet nuclear explosion as 23 September 1949. Actually, this was the date President Truman announced the explosion, which had occurred a few weeks earlier. But it is likely that only the specialist will be annoyed by such trivia. Some parts of the book have been extracted in the first two issues of *Sputnik*, the new Soviet English-language digest. But the book itself deserves an English edition. Or perhaps some bold soul will attempt a more definitive biography, contrasting and comparing this extraordinary scientist-administrator with his peers elsewhere.

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Viruses and Vectors

Insect Virology. KENNETH M. SMITH. Academic Press, New York, 1967. 270 pp., illus. $11.50.

A great many viruses are associated with insects. Some of the most important diseases of man are transmitted by mosquitoes and ticks, and many destructive plant viruses depend upon insect vectors for survival and dissemination. Many insects are themselves susceptible to specifically infectious viruses, and natural epizootics of such viruses often cause the decimation of host populations. Viruses have been utilized by entomologists in the management of a few pest species, and their potential usefulness as agents for biological control of a large number of important pest insects has stimulated research and interest during the last 20 years.

In this book Smith has reviewed a large proportion of our knowledge of the insect viruses. Most of the viruses, and even the suspected viruses, that are pathogenic for insects are discussed. A section on the relationships between plant viruses and insect vectors is included, but the important associations between mammalian viruses and insects are omitted except for brief mention in the introduction. The first chapters describe the various types of viruses and the diseases they cause. The literature is quite thoroughly reviewed and findings are presented in a lucid manner. It is this part of the book that will make it useful as a reference text.

In the last chapters Smith discusses some of the controversial subjects in the field. The section on the mode of replication is largely a summary of the work done 10 years ago by Smith and his group, and no mention is made of some of the most recent advances in this area. In the section on transmission and spread of insect viruses some very important and basic studies are not discussed. The chapter on inapparent or latent viral infections presents an interpretation that is open to serious question. Throughout the text there are general statements that are not supported by authoritative references, and the reader should be careful in his acceptance of these statements. But the book contains a good deal of useful information about the viruses of insects and when used with critical discretion will be of value to students as well as professionals.

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Radionuclides in the Environment

Radioecological Concentration Processes. Proceedings of an international symposium held in Stockholm, April 1966. BERTIL ÅBERG and FRANK P. HUNGATE, Eds. Pergamon, New York, 1967. 1054 pp., illus. $45.

The proceedings of any international symposium undoubtedly contain information of interest to investigators in the field concerned. The present proceedings contain a great deal of such information. Excellent reviews of several topics are among the hundred-odd papers included in the volume. Papers by such pioneers in the field as Comar and Lengemann and Scott Russell are not infrequent in the literature, but here these workers both provide current knowledge and ideas and indicate subjects needing further study. Other papers, by Hanson, Ekman, and Polikarpov, refer to specific problems in radioecology, in different ways suggesting further research and advocating caution in conducting it.

Unfortunately, summaries of only two sessions are included. One, by Miettinen, is in itself a comprehensive review of unique arctic food chains, supplementing that of Hanson. Hill's summary of the session on the behavior of natural radionuclides in the environment briefly reviews each paper of the session. His general comments could well be applied to the entire symposium, and should be noted by authors and editors. In reference to measurement techniques, their considerable variety and application near their limit of sensitivity, he says that "such a situation places a demand on authors that they should clearly demonstrate the reliability of their methods, and, thus, the validity of their results." Many of the symposium papers fail drastically in this regard, and several papers consist of tables or figures with no text. Others are poorly written, meeting none of the accepted standards for technical publications. In the cursory introduction, the editors point out that time did not permit much editing (none at all is apparent to the reviewer) and say that this should not be necessary since papers are from well-known institutions and scientists! The assumption is false, as most editors and referees of reputable scientific publications could testify. At least adequate proofing and a standard format are expected for a book of such price as this.

There are a sizable number of excellently written and interesting papers in the volume in addition to the introductory and session-summary papers mentioned above. An outstanding example is that of Whicker, Farris, and Dahl on radionuclides in a wild deer population and environment. Among these also are several papers on the behavior of radionuclides in soils by U.S.S.R. investigators (Kwaratskhelia *et al.*, Pavlotskaya *et al.*). Noteworthy, also, is Hawthorne's paper on transfer of ^{137}Cs to milk. In the session concerned with the marine environment, the paper of Phelps on partitioning of stable Fe, Zn, Sc, and Sm in a benthic community indicates a comprehensive study and results of significance. In his paper on the concentration and radiation effects of isotopes of strontium in fish, Townsley describes well-designed experiments and their results. Important also is his remark cautioning that the applicability of many reported findings to the establishment of "safe levels" for disposal of radionuclides in the marine environment is limited because of the complex nature of that environment. A number of other papers could easily provoke useful discussion.

Since the objectives of the symposium were not stated, the reader can assume them. The volume, in any case, does provide a considerable amount of interesting and new material and some more recent approaches to concentration of radionuclides in biological systems. It should prove to be a useful reference to studies in this field carried out in many parts of the world. A nuclide index is included which may be helpful to many.

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Light on a Clouded Hypothesis

Set Theory and the Continuum Hypothesis. PAUL J. COHEN. Benjamin, New York, 1966. 160 pp., illus. Cloth, $8; paper, $3.95.

In 1939 K. Gödel showed that the Zermelo-Fraenkel axioms of set theory were not strong enough to refute Cantor's continuum hypothesis. Gödel's attack on set theory had the startling feature that it made essential use of the properties of language: it was the nature of the language of the axioms of set theory, rather than the intended meaning of those axioms, that made it impossible for them to refute various hypotheses of set theory. In 1963 P. J. Cohen completed Gödel's linguistic attack on set theory by introducing the immensely valuable, syntactic notion of forcing, and by using it to demonstrate that the axioms of set theory were not powerful enough to prove Cantor's continuum hypothesis. Thus the presently existing axioms of set theory leave the most celebrated hypothesis of set theory shrouded in uncertainty.

This book, as its jacket indicates, is intended for those who are not specialists in mathematical logic. I believe that specialists too would benefit from a perusal of it, for it avoids the dense clouds of dirty details that fog up most books on mathematical logic and thereby obscure all the shining ideas. Mathematical logicians, as a class, seem more afraid than most other kinds of mathematicians of making mistakes. Cohen seems to have no such fear, and consequently he succeeds in presenting in the first two-thirds of his book a delightfully clear and intuitive account of Gödel's work on undecidable sentences of formal number theory and on the irrefutability of the continuum hypothesis, an account that can be readily comprehended by nonlogicians. It is true that the beginner will experience difficulty in filling in details, but he can, if he wishes, extract them from other books and, more important, he can take comfort in the fact that a truly modern mathematician does not require a detailed understanding of the ideas he uses before he uses them.

Section 3 of chapter 3 contains the most penetrating exposition of Gödel's notion of absoluteness that I have seen in print. It is also good to see (section 4 of chapter 3) in print at long last a precise version of the well-known observation that the power set axiom can be proved to hold in L without using the full power of the replacement axiom. Incidentally, line 9 of section 4 of chapter 3 demonstrates that the author, despite the solemnity of his undertaking, is not without humor.

The final section of the book touches, as is fitting, on philosophical matters connected with the continuum hypothesis. The author conjectures that the mathematicians of the future will see clearly that the continuum hypothesis is false. He seems to base his conjecture on the idea that the iterative principle needed to form aleph-one is less "bold" and less "rich" than the iterative principle needed to form the power set of aleph-null. Before he states his conjecture and the grounds on which it rests, he notes, quite rightfully, that most mathematicians hold the idealist view concerning the existence of sets, and that as a consequence they regard discussions of the truth or falsity of the continuum hypothesis as meaningful. One must wonder if mathematicians of the future will regard such discussions as meaningful. After all, there was a time when most deep thinkers regarded the following kind of talk as sensible: "Now being is predicated absolutely and primarily of substances; it is predicated secondarily and as in a qualified sense of accidents. For this reason essence is truly and properly in substances. . . ." I conjecture that the number of present-day mathematicians who find Aquinas's discussion of being and essence meaningful will equal the number of mathematicians of the future who will find discussions of the truth-value of the continuum hypothesis meaningful.

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A Challenge to Those Who Would Avert Starvation

Famine—1975! America's Decision: Who Will Survive? WILLIAM PADDOCK and PAUL PADDOCK. Little, Brown, Boston, 1967. 286 pp., illus. $6.50.

From its title, one might infer that this book is an attention-seeking potboiler, on one of today's ever more gripping and therefore popular subjects. It is not. It is deadly serious, a solemn analysis of things to come in the food domain, together with a proposed plan for action in a field where others have none. The brothers William and Paul Paddock are unusually qualified to write on the subject of food, population, and related problems in underdeveloped countries. Paul Paddock has served in the U.S. Foreign Service for over 20 years, almost entirely in underdeveloped countries. William Paddock is an agronomist, and has spent most of his professional life in the underdeveloped countries of Latin America. They have written one earlier book—*Hungry Nations* (1964)—devoted to the analysis of how food production might be increased in underdeveloped countries. The present volume is incomparably better—sparkling and gripping in style, closely reasoned, inexorably logical. It is to be recommended to all those interested in the shape of our world in the next ten years.

The basic thesis of the brothers Paddock is that famine must inevitably come to the underdeveloped nations, beset as they are and have been in recent years by unprecedentedly rapid rise in population and unforeseenly slow rate of increase in food production. All serious students of the plight of the underdeveloped nations agree that famine among the peoples of the underdeveloped nations is inevitable. The U.S. Department of Agriculture, for example, sees 1985 as the beginning of the years of hunger. I have guessed publicly that the interval 1977–1985 will bring the moment of truth, will bring a dividing point at which the human race will split into the rich and the poor, the well-fed and the hungry—two cultures,