figure, and the original diggers in the country of origin get a mere pittance. One major result is the destruction of sites, and another is that specimens so obtained have been removed from their context and their real meaning in cultural terms is lost.

An Introduction to Prehistoric Archeology has a broad coverage of archeological literature in the New World and in the Old World because of the cooperation of R. F. Heizer, primarily a western American specialist, and F. Hole, who is beginning a career in Near Eastern prehistory. Most of the books and papers listed in the bibliography are in English, since the volume is designed for an American audience.

In treating the varieties of techniques, methods, and disciplines available for interpreting the past, the volume is primarily descriptive. There are critical and cautioning statements about the application of many of these—for example, "Although there is a variety of methods for dating archeological materials by means of geology, none of the methods is simple. In all cases it is better to have several independent methods for dating particular events. Used alone, any method that depends on far-reaching correlations of geologic stratigraphy is likely to be undependable because of weak links in the chain of observations. Archeologists should use, but be aware of the many imprecisions of, geochronologic dating" (p. 166).

The examples of acceptable and of poor methods of prehistoric research could have been multiplied many times from literature in English, and from that in many other languages. The authors have been wise, however, in this introduction to limit their references to relatively brief comments, allowing the reader to pursue by way of the bibliography any of the many research leads that are mentioned. Of the several volumes that discuss archeology as a field of endeavor, this book is probably the best available.

In discussing the "Rate of Accumulation" method of dating, Heizer states that M. R. Harrington, in 1933, obtained the correct age of the Gypsum Cave culture in Nevada at 10,500 years ago, even though his estimate was based on incorrect evidence. He cites the radiocarbon age of sloth dung from the cave (C-221, 8505 ± 340 B.C.) as certifying to the age of Gypsum Cave culture. In other contexts, Heizer, as well as other archeologists, has taken the position that although the early Chicago black carbon run *may* date the organic material in the sloth dung, a better estimate of the Gypsum Cave culture would be to obtain a radiocarbon run on some of the wooden dart shafts from the Cave.

A large number of the books about archeology that come to the attention of the American public are dramatic fiction about the romance of archeology, or nice little books about the ease with which one can do archeology. This publication is testimony to the many faceted phases of prehistoric archeology which no single person can master, but which should be known to all competent practitioners. Even a brief investigation of the book will allow one to understand that there are no "compleat" archeologists.

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Ethnography

The High Valley: An Autobiographical Account of Two Years Spent in the Central Highlands of New Guinea. Kenneth E. Read. Scribner, New York, 1965. xviii + 266 pp. Illus. $6.95.

There is no commonly accepted way of writing a descriptive account of an exotic or primitive people. About all that contemporary ethnographies have in common is that they are crammed with data related to a special problem and are written in a style that is as objective and impersonal as possible. Many of the personal insights and reactions that an author experiences during his period of living with the people he describes are deliberately obscured by this detached presentation. *High Valley* is a notable exception to this tradition. As its subtitle, *An Autobiographical Account of Two Years Spent in the Central Highlands of New Guinea*, suggests, it is a narrative of a residence among a primitive people in which self-observation figures as importantly as analytic observations of a tribal people. The people are a group that has been transformed within the span of a single generation from a remnant of the stone age world into a suburbia of an Australian frontier town. The author is an Australian-born social anthropologist whose gift for writing sensitively beautiful prose is equaled, perhaps, only by his professional skill in probing the core of common human emotions that lies beneath the veneers of contrasting cultures which separate these people from himself.

The account is organized around the lives of a few individuals and their intimate responses to the social life around them. In this respect the book is abundantly anthropological. But the author himself was also a significant, if alien, part of this life for the months he describes, and in this context he exposes his own feelings with as much candor as he examines his friends. In this respect the book has no prototype in anthropological writings. Anthropologists who have lived with primitive peoples have felt the initial emptiness of being isolated among total strangers, but have come to enjoy warm and close personal friendships with persons of a completely different cultural heritage, only to sever these friendships abruptly and perhaps forever, cannot read the author's self-revelations without being profoundly, even painfully, stirred. The lasting impact of the book, however, comes from the development of a few mundane events and tense social crises in which the cast of principal characters is enmeshed into a drama of stark realism that is at once tense and poetically exquisite. *The High Valley* eminently achieves what its author intended it to be—an experiment in ethnography that gains a special lucidity by being fine literature.

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Space Science

Space Physics With Artificial Satellites. Ya. L. Al'pert, A. V. Gurevich, and L. P. Pitaevskii. Translated from the Russian (Moscow, 1964) by H. H. Nickle. Consultants Bureau, New York, 1965. x + 240 pp. Illus. $25.

This book is an interesting collection of results that repeat and extend work presented by the authors in a series of journal articles. Most of the book is devoted to a collision-free approach for determining the distribution of charged and neutral particles in the vicinity and in the wake of a body moving through a rarefied plasma. If

there is a unifying concept in the presentations, it is the use of kinetic theory —that is, solving the Boltzmann equation for many different situations.

The title is somewhat misleading in that the book is concerned with effects of the disturbing body on the ambient medium. Physical measurements are usually made by determining the effect of the medium on the body.

Overall, the authors cover many problems and develop in considerable detail analytical solutions on the basis of kinetic theory. The first problems considered are concerned with the density distribution of neutral particles, electrons, and ions about and in the wake of a body moving at high velocity (relative to neutral thermal velocity). Variants to this problem include different flow speeds, the presence of magnetic fields, the relative direction between velocity and magnetic-field vectors, and body size in comparison with Larmor radius and Debye thickness. A considerable effort is devoted to describing the electric field about the disturbing body and the interaction of this field with the flow, again varying the many parameters mentioned above. The authors also present a discussion of the effect of the ambient plasma on an electric field radiated from an antenna element. Fourier (space-wise) spectra of the disturbed flow region are determined for many of the above situations, and the problem of electromagnetic-wave scattering is considered; in conjunction with this quite a few tables and graphs are given to assist in estimating scattering cross sections.

The book presents an excellent demonstration of the kinetic-theory approach and, with the exception of a superficial discussion of accommodation coefficients (p. 33), is well written on a uniformly high level. Unfortunately the editing of the English-language translation was very poor: Equation numbers are occasionally omitted; one complete paragraph (p. 73) is repeated; and there is something missing between the bottom of page 190 and the top of page 191. References to volumes by Landau and Lifschitz give page numbers in the Russian but not in the English edition, and the volume *Fluid Mechanics* by Landau and Lifschitz is referred to as "Mechanics of Continuous Media." It is a pity that just on page 1 a misprint, an error by the authors, and a sentence rendered obsolete by recent discoveries should combine in a manner that could give an unfair impression of the book to anyone who begins reading it: The ratio of charged to neutral atmospheric particles at a height of 300 km is given as 10 rather than as 10^{-3}; five lines later the authors state that "above 1200 to 1400 km molecular hydrogen predominates" (it is atomic hydrogen); and six lines beyond that we find the statement that nothing is known about where the gaseous envelope which moves with the earth ends and where interplanetary space begins—"one can assume that at distances of three to four times the earth's radius we already have interplanetary gas" (the discovery of the magnetosphere has changed all that).

In view of the price of the book, $25, one might have expected a better editorial job.

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The Sex Attractants of Insects

Insect Sex Attractants. Martin Jacobson. Interscience (Wiley), New York, 1965. 154 pp. Illus. $7.75.

About one million living insect species have been formally described to date; according to a recent statistical extrapolation by the British zoologist C. B. Williams, two million more may await recognition. Entomologists are accustomed to finding hundreds or thousands of species living together at single localities. In this welter of predators, parasites, competitors, mimics, commensals, symphiles, and sibling clusters, privacy in communication is surely at a premium. The coming together of the sexes especially must be accomplished with utmost delicacy and precision. In his book *Insect Sex Attractants*, Martin Jacobson succeeds to a considerable degree in showing how much of this communication is achieved by means of chemical secretions.

The study of insect sex attractants dates as far back as von Siebold, who in 1837 proposed that female odors function to entice males while male odors may be used as a stimulus in precopulatory contact. But it was not until 1960 that the first female attractant, a complex alcohol produced by the gypsy moth *Porthetria dispar*, was fully characterized. The past 5 years has seen a rapid growth of research programs on sex substances. Many of them are economically oriented, for as Jacobson and his co-worker Morton Beroza have pointed out, insects depend for their reproduction on these odors, and "frequently they can be attracted by means of a chemical to a trap for detection purposes, or to a toxicant that destroys the insect, or to a substance which makes them incapable of fertile mating." The hope exists that sex attractants can be used to single out individual pest species for destruction without creating the undesirable side effects often associated with general insecticides.

Insect Sex Attractants is a straightforward compilation, written in a laconic style that makes few attempts at generalizations or judgments concerning current controversies. Perhaps this is just as well, for the subject is in that initial, logarithmic phase of its growth when energies are best expended in simply recording new phenomena. A total of 425 references in the bibliography covers most of existing knowledge. Several new generalizations that do emerge may surprise animal behaviorists interested in insect communication. Sex attractants have been demonstrated in almost all insects where they have been deliberately sought, including the housefly, at least one mosquito (*Culiseta inornata*), and the honey bee, species whose communication seemed previously to be dominated by signals in other modalities. Male sex pheromones are shown to be commonplace; some are aphrodisiac in action as envisaged by von Siebold, but others draw females over distances and elicit aggressive sexual displays in a fashion paralleling the female substances. Many of the female substances are not species-specific, for they can attract and induce copulation attempts by males of other, related species. Whether such interspecific signaling is as effective under natural conditions is another matter that awaits field studies.

This book is quite timely. The author has made the gaps in our knowledge obvious and inviting. Competing hypotheses concerning the molecular basis of olfaction and the mode of transmission of the chemical signals through the air, are described clearly and plainly. A section on methods of collecting and identifying attractants, Jacobson's own specialty, will be quite valuable to both chemists and biologists. The discus-