dependence mixed with antagonism.

In fact, it seems to me that Schelling himself has not grasped the full significance of his approach. Looking at the matter closely, we discover that the implications of his conflict analyses are even more radical than he himself allows. "Pure" zero-sum conflict does not represent an extreme type of institutionalized conflict. It can be shown that it cannot exist in a stable, institutionalized form.

Let us consider, for example, zero-sum parlor games like chess. The *formal* relationship between the players in their role as players is zero-sum. Their *existential* relationship, however, is not: as existing human beings, they are not merely locked in conflict; they also derive mutual pleasure from playing the game, and that is why they are playing it. Zero-sum game interaction is embedded here in a cooperative existential relationship. In all such cases, there is mutual interest in maintaining the integrity of the game, in playing according to the rules. Cheating in parlor games, on the other hand, introduces another nonzero-sum element—mutual damage—since it tends to undermine motivations to play the game and thus to eliminate the game as a source of profit to the cheater.

Schelling indicates a way of transforming chess into a nonzero-sum game by offering rewards for pieces that remain on the board. True, if we do this, there will be mixed game motivations; winning will not be the only thing that counts. But from the existential point of view, the game is nonzero-sum anyway. There *must* be another motivation than "winning," if the game is to remain alive as an institution.

What about sharp existential conflict situations such as duels and wars? One could argue that duels to the death, disregarding the unlikely outcome of both duelers being killed, represent an institutionalized form of zero-sum conflict. This would indeed be the case if the participants regarded being killed as the worst possible outcome. But in cultures where being killed is considered the worst that can happen to someone, such duels will disappear as an institution. The institution of mortal combat can subsist only where the dishonor of avoiding the risk of being killed is mutually deemed worse than death. Then the duelers will satisfy a mutual need for honor by fighting each other to the death. This mutual need alone can sustain the institution.

As to zero-sum war, the question is, to begin with, whether things can be so arranged institutionally that no mutually damaging outcomes *can* occur. This condition could be satisfied only by two types of war. One is a limited war with a stop rule such that the war must end when one side is clearly ahead or when there is a stalemate with both sides having lost their expendable forces. The other is a war in which one side is so much stronger that it does not face the risk of being worse off as a result of having fought. Both types of war have zero-sum features. The former, however, presupposes drastic limitation and, hence, the recognition of mutual dependence; it is somewhat like the zero-sum parlor game—a sharp conflict embedded in a more cooperative existential relationship. As to the latter, it presents a trivial strategic problem and will tend to drop out of the institutional picture: where *A* is so much stronger, *B* is far more likely to recognize him as master than to fight him. In all other types of war, mutual loss is a priori possible, and the game is nonzero-sum.

PAUL KECSKEMETI
RAND Corporation,
Washington, D.C.

Le Razze e i Popoli della Terra. vols. 1–4. Renato Biasutti *et al.* Union Tipografico-Editrice, Turin, Italy, ed. 3, 1959. 2914 pp. Illus. L. 37,000 (approximately $60).

The English language does not contain, as far as I know, a complete, modern work on global anthropology. The Italian language does. It is Renato Biasutti's mammoth, four-volume work on the races and peoples of the world, which was revised for the second time in 1959. According to my bathroom scales the volumes weigh 22 pounds, thus, its price is $2.73 a pound, less than twice the cost of good beefsteak. In the library of one American university, students who have not studied Italian keep the volumes in constant use, copying the numerous folding maps showing the distributions of boat types, house types, and other phenomena rarely charted in English-language publications. The type page is 8 by 5½ inches, and there is an illustration on two out of every three pages, as well as 45 tables in color (15 of which are pictures) and 30 maps, mostly folding. Were this book in English it would fill a crying need, but it is unlikely to be translated because of the cost.

The volumes cover human evolution, racial history, prehistoric archeology, racial movements and distribution, linguistics, and ethnography. To help him write it, the geographer, Biasutti, whose university post is at Florence, and who is now 82, enlisted the aid of 17 other professors—M. Bartoli, R. Battaglia, E. Cerulli, L. Cipriani, R. Corso, G. Genna, G. Gentili, P. Graziosi, L. Grotanelli, J. Imbelloni (Argentina), A. Micheli, M. Muccioli, N. Puccioni, S. Sergi, C. Tagliavini, T. Tentori, and G. Vidossi. All except Graziosi and Tentori contributed signed chapters either singly, in collaboration with Biasutti, or in collaboration with each other. Next to the maestro's, Battaglia's name appears most frequently. In addition to writing one section, Cipriani, who is famous for his photography, contributed hundreds of magnificient photographs.

Without great elaboration, little more can be said about this publication except that it is written in a uniformly simple style, so that anyone with the rudiments of Italian (or even just French or Spanish) can use it; that it is up to date; and that it is mostly noncontroversial. Biasutti's classifications of races and culture are based on geography, evolutionary status, and history. The concepts of several other schools of anthropological thought are explained, and the coverage is monumental. Although its function is encyclopedic, this opus is a much better teaching device than an encyclopedia. While too expensive for use as a textbook in any language, it belongs in every anthropological library. Many a junior professor of sociology and anthropology or some other combined field, faced with working up a course in general anthropology, will find it a godsend.

CARLETON S. COON
University Museum,
University of Pennsylvania

Men and Moments in the History of Science. Herbert M. Evans, Ed. University of Washington Press, Seattle, 1959. viii + 226 pp. Illus. $4.50.

The occasion for publishing this collection of nine essays was the 25th birthday of the History of Science Dinner Club, founded by Herbert Evans in 1932. The first essay, by Egon Brunswick, is a survey of "onto-genetic and other developmental paral-

lels in the history of science." It describes Brunswick's own work on the development of criticism in children and J. Piaget's parallels between theorizing in children and in the early history of physics. The stages of egocentrism, functionalism, and overgeneralization are recognizable in some of the stories of historical events which follow: Robert H. Lowie speaks of ethnocentrism as a stage in the development of ethnography; J. B. Stallo's critique of classical physics, explained here by Stillman Drake, can be understood as a fight against overgeneralization; and Newton's *Hypotheses Non Fingo*, to which E. W. Strong here devotes a penetrating study, could be linked to the search for the *genus proximum*, according to Egon Brunswick.

E. O. Essig gives a sympathetic picture of an almost unknown hero of science, Charles Fuller Baker, whose insect collection of about a quarter of a million specimens was saved by the Smithsonian Institution.

In the "Essays in biology," the *Festschrift* honoring Evans on his 60th birthday (1942), Frederick O. Koenig dealt with Sadi Carnot's thermodynamic theorems; he extends this study here to a detailed history of the second law of thermodynamics. Victor F. Lenzen presents a somewhat dry account of Max Planck's philosophy of science. Leonardo Olschki shows the wide influence that radiated from Marco Polo's description of the world. The last essay, on the first determination of stellar parallax, recreates the dramatic events of 1837–39 and the part played by Wilhelm Struve; the author is his great-grandson, Otto Struve.

This is a book for those adventurous spirits who love to make excursions beyond their fields of specialization.

EDUARD FARBER
4530 Brandywine Street, NW, Washington, D.C.

Plant Pathology. An advanced treatise. vol. 2, *The Pathogen*. J. G. Horsfall and A. E. Dimond, Eds. Academic Press, New York, 1960. xiv + 715 pp. Illus. $22.

In the second volume of their trilogy on plant pathology, the editors and their collaborating authors maintain the high standards established in volume 1. The theme of the present volume is the pathogen, in contrast to that of the earlier volume, which was centered around the diseased plant. In an interesting introductory paragraph, careful, even forceful, distinction is drawn between parasites and pathogens and, necessarily, between the resulting phenomena of parasitism and pathogenism. Many readers will be surprised to learn that these terms are not synonymous. The authors also emphasize that, in their opinion, diseases are *caused*, not *incited*, although the latter term has become increasingly popular in recent years. Pathogens are of many kinds, including not only the fungi and bacteria (which are usually thought of) but such diverse agents as nematodes, mites, insects, viruses, and many inanimate entities (for example, chemical deficiencies or excesses, and even various phases of unfavorable weather).

In the single chapter devoted to parasitism, George L. McNew thoroughly reviews the subject, presenting his material under such topics as the nature, origin, evolution, and physiology of parasitism. His discussion of the law of host-parasite balance in pathogens is particularly effective. In contrast, the remaining 13 chapters, each written by a highly qualified specialist, are devoted to pathogenicity or the ability of the parasite to produce disease. Three general phases of the subject, reproduction of the pathogen, the nature of pathogenicity, and the mechanisms of inhibiting the pathogen, are considered.

F. C. Bawden reviews the multiplication of viruses, broadening his presentation by including such topics as the differences between viruses and organisms, and analogies with bacteriophages. Lilian Hawker discusses the reproduction of bacteria, actinomycetes, and fungi. The insects and arachnids are left to the entomologists. Spore germination and the various factors affecting the phenomenon are discussed by V. W. Cochrane.

The broad field of the nature of pathogenicity or the ability of the organism to cause disease is presented in six chapters. Major topics considered are the mechanical and chemical ability to break host barriers; interactions of pathogen, soil, soil microorganisms, and host; the genetics of pathogens; and toxins. The problem of finding mechanisms to inhibit pathogens is met by a careful review of the current knowledge of virus inactivation and of the physiology and chemistry of fungicides.

The nematodes come into their own with the concluding chapter which, although headed nematocides, covers a broader field and is, in effect, a brief but thorough account of plant diseases caused by nematodes.

As in the previous volume the indexes are extensive and adequate.

JOHN A. STEVENSON
Crops Research Division, Beltsville, Maryland

Infectious Diseases of Animals. vol. 1 and vol. 2, *Diseases Due to Bacteria*. A. W. Stableforth and I. A. Galloway, Eds. Academic Press, New York; Butterworths, London, 1959. 396 pp.; 414 pp. Illus. $18 each; 2 vols., $33.

The first two volumes of a proposed encyclopedic record of the infectious diseases of animals have now been published. The subject matter in these two volumes is limited to the diseases caused by bacteria; diseases caused by rickettsia, viruses, and protozoa are to be covered in later volumes of the series. The editors have assembled an imposing group of British authorities, and each member of the group has written in a field of his special interest. In spite of the plethora of authors, the two volumes have exceptional continuity and uniformity.

The first volume contains chapters on actinomycosis and actinobacillosis, anthrax, brucellosis, clostridial diseases, coliform diseases, corynebacterial diseases, fungal diseases, glanders and melioidosis, Johne's disease, leptospirosis, and listeriosis. The second volume covers necrobacillosis, pasteurellosis, the pleuropneumonia group of diseases, swine erysipelas, tuberculosis, and vibrosis. The chapters are arranged alphabetically, a valuable point for the student.

Each causative agent is described in thorough detail, and in most instances the epidemiological and clinical features are adequately covered. The gross lesions are usually listed and described in some detail under "pathology," but rarely are microscopic lesions described. A few photomicrographs are used, but most of these are not of good quality. The other illustrations, particularly the charts, tables, and line drawings, although used sparingly, are informative and of good quality. The type is easily readable, and the paper is excellent.

The authors obviously made good use of the literature, particularly that