put-down to those writers who have captured the public's fancy with the idea that men are biologically more capable of cooperating in groups than are women. At the same time, most of the contributors also recognize that the biological facts of life have probably played a role, especially in earlier times, in the formation of the social and cultural patterns which are now so broadly acceptable that they seem to be innate. Sanday suggests, for example, that male roles in early history had to do largely with subsistence and defense since women were required to spend so much of their energy in child-bearing and child-rearing. She suggests that because of this biologically determined fact men were in a better position to gain control over strategic resources and thus, ultimately, over the society at large. One of the difficulties with this kind of argument, in my view, is that it often misses the point that lives themselves may be strategic resources, especially in societies where population size itself is a crucial variable in determining survival for the entire group. Why, then, should women not have achieved a more prominent position as a result of their control in this domain?

Chodorow, the only nonanthropologist among the contributors, presents ideas deriving from psychoanalytic and personality theory to explain how women become socialized into their roles. She notes that the universal assignment to women of the mothering role has effects on both male and female personality structures, to the possible disadvantage of both.

Most of the contributors, then, concern themselves with male and female roles in relation to power and authority over resources and people in the society at large. There is less attention to control over one's own body and activities. This issue might be termed the degree of "independence" which women as individuals are permitted in any given sociocultural system. Of course, it must also be examined in relation to the independence of men as well. Leis deals specifically with this and notes among the Ijaw of West Africa the separateness of the sexes in their daily activities and in the mechanisms they use for achieving personal autonomy on the one hand and societal preservation on the other.

Sacks and O'Laughlin, the latter in a brilliant analysis of how symbolic systems support behavior patterns necessary to the maintenance of the entire social order, also address themselves to this issue. Sacks, in reinterpreting Engels, espouses a Marxist point of view that tends to divert attention from sex to class. Like Engels, she notes the role of the development of private property in determining sex roles in class societies. She also notes that although both sexes are exploited by the system, women are put into a more subordinate position in class society because they are not defined as being socially adult. Rather, through the institution of the family, they are relegated to a peculiar status as wives and wards of men. It then follows that liberation necessitates changes in the family as well as in the economic system.

Aside from a few annoying lapses in scholarliness and a few more serious errors in logical analysis, I found the articles in this book—most of which are by authors who are relatively little known within the field of anthropology, either because of their relative youth or because they have chosen life paths which place their husbands' career plans ahead of their own—to be generally well written and the book as a whole to be a significant contribution. I should emphasize, however, that the book is in no way definitive, nor should anyone think that the last word is even around the corner. For example, no one has as yet, to my knowledge, applied formal methodological principles of ethnoscience to the study of women and the domains thought to be important to them. The positing of the domestic and public domains is a useful beginning, but as I have tried to indicate elsewhere (D. G. McGuigan, Ed., *A Sampler of Women's Studies*, University of Michigan Center for Continuing Education of Women, 1973), this analytic distinction may be oversimplified. I have suggested what I call a "supradomestic domain" lying somewhere between the two. I find this useful in dealing with those concerns which derive ultimately from the domestic sphere but which are controlled, in complex societies, at a higher than domestic level. I have hypothesized that women who enter the so-called political world in our own society tend to be concerned primarily with issues such as consumerism, health, and education, most of which may be seen as extensions of the formerly private or domestic sphere.

Certainly the tide has turned, and increasingly both men and women anthropologists will be paying attention to the fact that males and females may be said to live in different worlds, differently constructed and differently perceived. Much of the early ethnography should be reinterpreted and new studies undertaken to cast more light on some of the varied issues this book either introduces or takes for granted. Perhaps the most important of these is whether, in all societies, women are indeed subordinate to men and whether this has always been so.

I would urge that the book be read, but I would also urge that it be read critically, with the recognition that it is in many ways an incomplete and unrounded exposition.

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High Energy Physics

Particle-Interaction Physics at High Energies. S. J. LINDENBAUM. Oxford University Press, New York, 1973. xiv, 512 pp., illus. $48. International Series of Monographs on Physics.

Hadron Physics at Very High Energies. DAVID HORN and FREDRIK ZACHARIASEN. Benjamin, Reading, Mass., 1973. xviii, 378 pp., illus. Cloth, $17.50; paper, $9.50. Frontiers in Physics.

These books are as different as night and day. The first, a solid-looking member of the prestigious International Series of Monographs on Physics, is written by an experimenter and covers, albeit unevenly, all of high energy physics as it stood about 1970. The second, part of the Frontiers in Physics series, is written by theorists, treats strong interactions only, and deals almost exclusively with developments since 1970. For Lindenbaum "high energies" means incident laboratory energies up to about 30 Gev. Only at the very end, in a sort of "stop press" section, are data up to 70 Gev from the Serpukhov accelerator discussed. This is the domain where total cross sections appeared to be approaching constant asymptotic values. In contrast, while Horn and Zachariasen do mention energies below 30 Gev, their emphasis is on "very high energies," that is, energies attained at the intersecting storage ring (ISR) at CERN (the equivalent of up to 2000 Gev in the laboratory) or at the Fermi National Accelerator Laboratory (currently up to 400 Gev). This is the domain of rising total cross sections.

The books are almost orthogonal in content, then. What about purpose? Lindenbaum has written a monograph

that at inception was to have been about the interactions of pions and nucleons, but grew in the making to cover all of high energy physics in the 1960's. Horn and Zachariasen present a lecture-note review of the main experimental facts of very high energy interactions, the phenomenological framework for their interpretation, and the underlying theoretical ideas on which that framework is based.

A monograph is usually not a textbook. It presents the author's view of the subject, broad and authoritative perhaps, but invariably stressing the things that he knows best. Lindenbaum's book reflects his original intent and inclination. The research areas to which he was closest are treated with lavish care. Others receive short shrift. Only 74 pages are devoted to weak interactions and only 10 to electromagnetic interactions. Symmetry classifications and dispersion relations are the two theoretical topics given most extensive coverage. The 60 pages on dispersion relations reflect the zeal of a relatively late convert. Regge pole theory is cataloged, but suffers from the muddle of daughters and constraint equations that were topical in the late '60's. An abundance of data is presented, mostly in graphs with an occasional diagram of an experimental set-up. This mode of presentation properly gives the impression that high energy physics is predominantly an experimental science. Brilliant theoretical strokes have been accomplished from time to time, but much remains unexplained. Lindenbaum's book shows where much of the field was in 1970. It is traditional to commend the Oxford University Press on the handsomeness of its products. Certainly, Lindenbaum's book keeps alive the reputation. But it is regrettable that names are randomly misspelled, Vietnamese physicists are cut in two, and occasional figures are misattributed.

Horn and Zachariasen focus on total cross sections, elastic scattering, and single-particle inclusive spectra at very high energies, things that every graduate student knows are intimately related to unitarity (conservation of probability) in two-particle and three-particle collisions. They define the current jargon, survey the data by means of exemplary figures, and discuss the basic theoretical framework in the first 150 pages. As befits a "Frontiers" lecture note volume, the style is relaxed, the formulas are relatively simple, and the explanations are clear. Heavy technical discussion is reserved for appendices. The next 100 pages on models, first field theoretical and then multiperipheral, are more like a review. The material is technical; the reader is asked to accept much on faith. Nevertheless, the end results are there and references to the sometimes equally cryptic literature are given. More models (droplet, statistical, diffractive, hybrid) follow to the end. The reader who wants to see the various models confronted with experimental facts will be largely disappointed. The treatment is often stylized. The idea is uppermost; the grubby details of fits to data and reasonableness of parameters are generally ignored. Horn and Zachariasen is what it is advertised to be, an informal book on recently topical parts of high energy physics, about one-third phenomenology and two-thirds related theory. It should be useful in either lecture course or seminar.

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Issues Raised by Biology

Philosophy of Biological Science. DAVID L. HULL. Prentice-Hall, Englewood Cliffs, N.J., 1974. xii, 148 pp., illus. Cloth, $6.95; paper, $2.95. Prentice-Hall Foundations of Philosophy Series.

Working scientists have generally ignored an entire profession dedicated to explicating what they do. Philosophers of science have usually responded in kind by filling their journals with an arcane sort of laundry-washing that piles commentary upon commentary, soon losing sight of the scientific document that inspired it several generations ago. This lamentable gap is occasionally bridged by a man boasting competence in both fields—Percy Bridgman, to choose an old example—or by a philosopher with both exceptional insight and lucidity of style—like N. R. Hanson of late and good memory.

In this small book, David Hull has labored to integrate philosophy and biology for students and practitioners of both fields. I pay tribute to his skill and commitment by reporting a job well done in so few pages. In suspecting, as I do, that it will inspire no substantial rapprochement of the two disciplines, I merely comment upon a situation far beyond the power of a single author to correct.

Hull has chosen the lively strategy of few, relatively independent chapters directed to specific issues in preference to the logical, sequential, and laborious development of the Teutonic tome. He begins with a technical chapter on the possibility of reducing Mendelian to molecular genetics. (He is not sanguine about the prospect, but argues cogently that such a classical reduction might not be the *summum bonum* that a philosophy of science based on physics often portrays.) Following chapters discuss the structure of evolutionary theory, biological laws, teleology, and the controversy of organicism vs. reductionism. Hull takes very few positions, largely confining himself to explication and clarification—an admirable course in such muddy waters.

In his more specific discussions Hull touches (at least *en passant*) all the perennial issues in philosophy of biology: reduction, teleology, holism, prediction and explanation in historical science, to name a few. But his strategy precludes a proper setting of these issues within the history of Western thought and thereby fails to explain why they should concern us. Each chapter stands well by itself, but the cement is missing. (The Teutonic tome—if we reach the end awake, or reach it at all —provides this at least.) Thus I doubt that this book can be, as Hull hoped (p. xi), a self-sufficient introductory text for students. It is simply too difficult for what it must leave out.

Since Hull is a philosopher by profession, we might have expected a book about philosophy for biologists. Instead, for reasons good and not so good, it is more a work about biology for philosophers. Hull does not always succeed in avoiding excessive comment on the private debates that philosophers pursue with gusto and biologists know nothing about—for example, Ruse and Smart on laws, and peripheral aspects of the important (though seemingly endless) debate on Hempel and Oppenheim's thesis of symmetry between prediction and explanation. On the positive side, Hull has a fine knowledge of biology (both the facts and that elusive "feel" that only a professional can recognize); he becomes, thereby, our best emissary to the other culture. In this position, he can employ biology to enrich a philosophy of science based too much upon physics and its occasionally arrogant assumptions of hierarchy (with fundamental and derived sciences), proof, reduction, and the crucial experiment. This he does in suggesting, for example,