but to several of its more particular assertions. It is, for example, a misconception that applied anthropology "by definition represents a reaction against cultural relativism, since it does not regard the culture that is applying anthropology as the equal of the culture to which anthropology is to be applied." This may or may not be the case. At times its purpose has been the preservation of cultural differences. Similarly, the alleged shift from the concept of culture as a mechanical sum of its parts, or as an organism, to its conceptualization as a construct of the anthropologist is by no means evident. On the contrary, there is a vigorous and militant philosophy which rejects this subjective estimate of culture. Although some of the alleged changes in anthropological research and theory are verifiable, the reasons ascribed to them are questionable. A differentiation between "culture" and "society" has indeed emerged in American anthropology in the last 25 years; but this is not because they are now treated as polar concepts demanding a choice between one or the other. Rather, they have come to be accepted as complementary aspects of socialized human behavior in place of the earlier American notion that all such behavior could be termed "cultural." The insistence upon this differentiation can be attributed to the sociologists, and its effects are clearly discernible if one compares the 1923 and the 1948 editions of Kroeber's *Anthropology*. It is also true that anthropologists have turned more and more to the study of Western culture, but not so much as a result of the war as (i) to accept the challenge that their research methods are inapplicable to complex societies, (ii) to participate in the booming fashion to study cultural and social change, and (iii) to face the simple fact that they are rapidly being precluded or excluded from the study of the human groups with which they usually are identified—the so-called untouched primitives.

Finally, it may be said that Wolf has overlooked one of the most conspicuous changes in anthropology in the last 25 years—its fragmentation into its several subdisciplines. If it is true, as Wolf contends, and as it seems to be, that anthropology is less a subject matter than a bond between subject matters, then we are now witnessing the dissolution of those bonds and thereby the loss of its most distinctive feature. It can scarcely become a science of man, any more than can economics or psychology, if it succumbs to the seemingly inevitable strains that divide it into its archeological, physical, linguistic, social, and cultural components. It is becoming increasingly difficult to treat them as a unit. That is probably one reason why the attempt was not made in this essay, which is concerned primarily with what is commonly called cultural anthropology. Even this limited field has become so diversified that the characterization of its frontiers is very much a matter of preference. It can be maintained, for example, that the emergence of the subfield of applied anthropology, or the popularity of cultural change studies, are at least as remarkable as the decline of romanticism, and that the latter is in fact more apparent than real if one considers its prevalence among new recruits to the profession. It may be that the muffling of cultural relativism as well as romanticism are functions of individual maturity rather than signs of the times.

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Hormone Mechanisms

Actions of Hormones on Molecular Processes. Gerald Litwack and David Kritchevsky, Eds. Wiley, New York, 1964. xii + 583 pp. Illus. $17.

The status of the problem of hormone mechanisms has been described as a plethora of information accompanied by a dearth of understanding. In the 140 years since the first effect of a humoral agent was recognized, some 20 types of hormones have been obtained in essentially pure form, and the precise chemical structures determined for at least a dozen. A voluminous literature describes the effects of hormones on the growth, function, composition, and metabolism of tissues and organs. In view of this wealth of knowledge about what hormones are and what they do, it is remarkable that in not one instance do we know how they do it.

Current efforts to elucidate the biochemical (or biophysical) mechanisms of hormonal regulation of cellular function will be aided by *Action of Hormones on Molecular Processes*. Although the book cannot, at the present state of knowledge, disclose how hormones actually perform at a molecular level, it does provide, for certain classes of hormones, (i) a convenient summary of their important physiological effects, (ii) a discussion of phenomena at the cellular and intracellular level which might represent the primary hormonal actions, and (iii) a well-documented description and evaluation of experiments, both in vivo and in vitro, relevant to the mechanisms of hormone action.

The book consists of 19 contributions that vary considerably in length and approach. In the opening chapter, T. R. Riggs presents a comprehensive discussion of the rather general ability of hormones to modify the transport of nutrients across cell membranes. In the subsequent treatment of individual hormone classes, the influence of thyroid hormones on protein synthesis is discussed by S. Price, on lipid metabolism by D. Kritchevsky, and on enzyme systems in vitro by G. Litwack; J. R. Tata presents an extensive general consideration of the action of thyroid hormones at the cellular level. The action of insulin on carbohydrate metabolism is discussed by J. Ashmore and L. Carr, on lipid metabolism by A. I. Winegrad, and on protein biosynthesis by I. G. Wool; the latter paper also provides a perceptive evaluation of the overall insulin problem. Epinephrine and norepinephrine are considered with respect to their disposition and metabolic fate by I. J. Kopin, their effects on metabolic systems by J. H. Hagen and P. B. Hagen, and their action at the molecular level by J. A. Buzard.

The steroid hormones receive less comprehensive coverage, but certain aspects of their actions are treated in excellent fashion. Studies of the mechanism of cortisone action are described by P. Feigelson and M. Feigelson and adaptive changes in enzymatic activity induced by glucocorticoids by C. A. Nichol and F. Rosen. The effects of sex hormones on the metabolism of amino acids and proteins is competently discussed by E. H. Frieden and their action on the structure and activity of glutamic dehydrogenase by G. M. Tomkins and K. L. Yielding; H. G. Williams-Ashman and S. Liao objectively evaluate the ability of sex hormones to participate in hydrogen transport by isolated enzyme systems. The mode of action of both androgens and gonadotropins is discussed by R. I.

Dorfman, and the influence of gonadotropic hormones on end-site metabolism by W. H. McShan and J. F. Perdue. Finally, W. D. Davidson and R. E. Davies provide an interesting description of gastrin and the duodenal hormones, although, as the authors point out, the primitive state of knowledge in this area precludes meaningful consideration of their action mechanisms.

The book is attractive, easy to read, and well edited, although I noted occasional errors in formulas, figure legends, and references. It is highly recommended to all who are interested in biochemical endocrinology.

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Semiconductors

Physics of III-V Compounds. Otfried Madelung. Translated from the German by Dietrich Meyerhofer. Wiley, New York, 1964. xiv + 409 pp. Illus. $13.

The III-V compounds are semiconductors made from the elements of the third and fifth groups of the periodic table, notable examples being gallium arsenide and indium antimonide. Although they can be made n and p type, it is unlikely that they will ever replace silicon and germanium for use in transistors. They do, however, offer characteristics which are different from the two classical semiconductors and which can result in specialized uses. These include high mobilities and small impurity-binding energies that are useful for certain high-frequency devices and for infrared detectors, and direct band gaps that lead to efficient radiative hole-electron recombination and have resulted in injection lasers. It is probable that the purely scientific aspects of these materials are almost all a direct extension of those developed for silicon and germanium.

During the last 12 years these compounds have been intensively investigated, and in this book Madelung sets out to present an account of their physical properties, specifically excluding the technology and applications of these materials. These somewhat limited aims have been admirably met. In general, the author gives a brief but useful outline of the theory of a branch of the subject, such as optical properties or transport properties, and then presents an exhaustive account of what is known concerning these topics for each of the III-V compounds.

Very little has been left out, and the book is remarkably up to date. About 1300 references are cited, many of them published in 1964. The presentation of the results is reasonably critical, for in most cases an effort is made to decide between conflicting views. In addition, the properties of the compounds are compared and contrasted with one another and, to the extent possible, a unified picture is presented. There are useful summarizing tables. The translation is well done, and I noted very few errors of fact. The only misprint that I noted was in the publisher's blurb. Perhaps, with the spread of scientific literacy, scientific publishing houses will one day know that the English form of the most successful transistor material is silicon, not silicium.

This book is not intended for students, but, for some years to come, it will surely be a most useful volume to anyone active in the field of semiconductors.

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History of Biology

Circulation and Respiration: The Evolution of an Idea. Mark Graubard. Harcourt, Brace, and World, New York, 1964. x + 278 pp. Illus. Paper, $2.95.

The compiler of this excellent little book is professor of natural science at the University of Minnesota where, for a number of years, he has been using the historical approach in teaching science to undergraduates. Mark Graubard, who is primarily a biologist, is well qualified to prepare a book such as this one.

He traces the historical development of the idea of the circulation of the blood through pertinent and well-selected extracts from the writings of 17 workers from Aristotle to Borelli. Most of the texts, including of course readings from Harvey, relate to the circulation, while only four represent the beginnings of our understanding of respiration. Graubard has added pungent and provocative commentaries to each selection. The reader is thus guided along the difficult and tortuous path by which we developed our knowledge of circulation and respiration during a time span of 2000 years.

This book is recommended to anyone interested in the history of science in general or the biomedical sciences in particular. It will be especially useful as a case history illustrating scientific methodology.

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Geochemistry

Interprétation Géochimique des Éléments en Traces dans les Roches Cristallines. Denis M. Shaw. Masson, Paris, 1964. vii + 237 pp. Illus. Paper, F. 56.

In recent years the trend in geochemistry has been swinging more and more toward laboratory experiments designed to simulate the natural environment, particularly under conditions of very high temperature and pressure. It is not as common to find a major work in geochemistry that approaches the subject from the viewpoint of rocks as they actually occur rather than how they ought to occur. Shaw's treatment of trace elements in crystalline rocks starts with field data, and then proceeds to a consideration of concepts of genesis that are consistent with these data. It is built on the traditions of V. M. Goldschmidt, pioneer geochemist and author of *Geochemistry*, a classic monograph that covers the distribution of elements not only in igneous rocks, but in natural waters, vegetation, and atmosphere. Shaw's principal contribution is to present an updated version of Goldschmidt's review insofar as it applies to igneous rocks.

The first 74 pages of Shaw's monograph treat purely technical problems in the analytical chemistry of trace constituents of silicate rocks. The next 109 pages present data on the trace-element content of genetically related rocks and of coexisting minerals. The data are arranged according to the various natural laws that have been proposed for the partition of major and minor elements between the solid and the liquid phases. The final 28 pages are devoted to the possible application of trace-element studies in