rial. Many of the studies presented here simply add to a growing list more organisms that enjoy a nerve-dependent regeneration. More than 100 pages of the text are devoted to regeneration in flatworms. Here, the text seems to lapse into a combat of personalities rather than a search for crucial experiments to determine once and for all the origin and nature of the cells constituting the blastema. The French authors who work with these organisms should have had their ofttime repetitious discussions before the conference and then, at the conference, they should have presented suggestions for critical experiments. One is continually aware of the need in this field for constructive models, a breaking of the rigid "set" of ideas that we have carried for 50 years; in short, a *rejuvenation.*

Certain papers written in a more theoretical vein are exciting—for example, Goss's analysis of regeneration from the evolutionary-adaptive point of view and Clark's ideas on cell adhesion in blastemal cells. Tardent's breakthrough in invertebrate tissue culture, Singer's quantitative approach to nerve-dependent phenomena, and Simpson's demonstration of cartilege induction in lizards by ependymal cells are highlights. The careful work of Trampusch and Abeloos, plus their general contribution to discussions, and the reviews of Herlant-Meewis, on asexual reproduction, and Needham, on hormonal control of regeneration in arthropods, are extremely informative.

This text is excellent reading for the aspiring, young developmental biologist. It will provide him with a great backlog of valuable information and convince him that he is at the frontier of development the first day he begins a regeneration experiment.

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Biochemistry of Animal Development

The Biochemistry of Animal Development is a two-volume treatise (volume 2 has not yet appeared) which, according to the fly leaf, is intended to provide an "introduction to the biochemical study of animal development," with emphasis on "current research as well as on those investigations in which a promising contact between experimental embryology and biochemical inquiry has been established." Volume 1, **Descriptive Biochemistry of Animal Development** (Academic Press, New York, 1965. 662 pp., $23), edited by Rudolf Weber, contains three major headings—(i) Biochemistry of Germ Cells and Fertilization, made up of two chapters: "Chemical constitution and metabolic activities of animal eggs" (by J. Williams) and "Biochemical aspects of fertilization" (by A. Monroy); (ii) Biochemical Patterns in Embryos, made up of three chapters: "Morphogenetic significance of biochemical patterns in sea urchin embryos" (by T. Gustafson), "Morphogenetic significance of biochemical patterns in mosaic embryos" (by J. R. Collier), and "Biochemical patterns in early developmental stages of vertebrates" (by E. M. Deuchar); (iii) General Biochemistry of Development, made up of four chapters: "Enzyme development in relation to functional differentation (by F. Moog), "Development of nonenzymatic proteins in relation to functional differentiation" (by J. B. Solomon), "Biochemical mechanism of information transfer" (by M. Staehelin)," and "Informational molecules and embryonic development" (by P. Grant). "The history of chemical embryology," an introductory chapter by J. Brachet, effectively brings into perspective the "pre-Needhamian" era and the developments since the appearance of Needham's monumental three-volume opus *Chemical Embryology* (1931).

In addition to a separate author and subject index, an index to genus and species names is provided.

It is no longer possible for an individual scientist to review and deal critically with the developments in a broad and rapidly developing area such as chemical embryology. As a matter of fact, the effectiveness of an editor, in the case of a multi-authored volume such as the one under review, in insuring clearly defined areas of review, critical selection, and evaluation of the subject matter to be discussed with minimal redundancy, is limited. Thus, as with most current review volumes of this type, the chapters vary greatly in their scope, emphasis, and usefulness to the individual reader. In the present volume, the scope varies from a chapter that reflects a strong author-oriented view (chapt. 3) to a synopsis of a course on introductory molecular biology (chapt. 8). The discussion in chapter 5 includes a series of *caveats* to warn the classical embryologist that biochemical procedures have to be carried out with appropriate and modern techniques and interpreted with great care, and to warn the biochemist that embryology is very complex. The reader profits from such a discussion (if the obvious isn't belabored), but a reviewer is burdened by the necessity of making certain that the most up-to-date and reliable biochemical methods are presented. Unfortunately, this was not always done in this volume. Thus, for amino acid analysis by microbiological assay and paper chromatography, references are given to papers published in 1943 and 1944 and to a review paper published in 1955. The chapter on enzyme development attempts to come to grips with such questions as what significance (biologically) one can attach to an increase or decrease in enzyme activity; is an increase in enzyme activity evidence of activation of an inactive precursor, or is it the result of *de novo* synthesis, for example.

The quality of the reproduction of figures and photographs varies greatly. The lettering and numbers of some figures are barely legible (compare Fig. 11, (*a*) and (*b*), p. 158); the electron micrographs reproduced on pages 219 to 221 are very poor and lack information on magnification; they contrast sharply with those on pages 450 to 453.

As one would expect in a relatively recent review on development, the invocation of the operon theory in terms of the genetic code, messenger RNA, regulation by induction and repression, and the like, is prominent throughout Chapter 8, "Biochemical mechanism of information transfer," and chapter 9, "Informational molecules and embryonic development" overlap to a large degree.

The difficulty of keeping the literature references up-to-date in the face of the considerable delay in publishing a volume such as this is again revealed in this book. Only a few references more recent than 1963 are cited. (Addenda are provided for chapts. 6 and 8 with references as recent as 1965.)

The volume will undoubtedly prove useful to a wide variety of readers, if for no other reason than that it provides a useful bibliography (up to 1963!) and identifies research efforts in a field which is attracting biochemically trained biologists and yielding exploitable biochemical concepts. Although the complexity of the challenge is made

clear, the reader will readily sense the promise for the early emergence of basic, biochemically defined mechanisms that are conceptually adequate to describe the controlled series of sequential changes occurring in the development and differentiation of animal embryos.

The amount of new information published since this volume went to press speaks for the current vigor of this field of investigation as well as for the limited "timeliness" of a volume published in 1965!

The following statement is from the preface: "The present treatise is, therefore, intended to introduce advanced students already familiar with elementary embryology and biochemistry to various areas of biochemical embryology." Further, it is stated that "In selecting the material, emphasis has been placed on those problems in which research is currently most active and in which a promising contact between experimental embryology and biochemical inquiry has been established." For the most part these objectives have been realized—at least as well as is possible in the current scene of relatively rapid appearance of scientific papers and the relatively slow publication of multi-authored, expensive review volumes.

The need for a greater number of inexpensive paperback reviews of more limited scope, which can be more rapidly published and revised (or discarded!), is urgent to help stem the spate of expensive volumes that are rapidly filling our libraries with rapidly obsolescent information.

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Science in Hungary

The Hungarian word for science, *tudomány*, has a broader meaning than its English equivalent. The concept is more closely related to the German term *Wissenschaft*. Thus, the Hungarian notion of science includes both the natural and social sciences and even some of the humanities. **Science in Hungary** (Corvina Press, Budapest, Hungary, 1965. 348 pp.), edited by Tibor Erdey-Grúz and Imre Trencsényi-Waldapfel, devotes seven chapters to the natural sciences (mathematics, physics, chemistry, agronomy, earth sciences, biology, and medicine) and 12 chapters to the social sciences and humanities (economics, linguistics, ethnography, philosophy, archeology, Oriental studies, musicology, history, political and legal sciences, history of art, and classical and literary scholarship).

The introductory chapter, by T. Erdey-Grúz, describes and analyzes the growth and institutional setting of modern science in Hungary in the period following World War II. It devotes special attention to the Hungarian Academy of Sciences, an institution founded some 140 years ago, which since 1949 has directed the scientific life of the country by coordinating the work of research institutes and learned societies. Each chapter traces briefly the historical development of a particular discipline in Hungary and presents its achievements and problems. Major representatives and publications (books and journals) in each field are enumerated for the period treated.

A more detailed treatment of the role of the universities and learned societies, the traditional centers of science in Hungary, would have made the book more complete. The disproportionate emphasis on the humanities and social sciences is surprising in view of the fact that more than 70 percent of the academicians are active in the natural and exact sciences.

The book does not answer the puzzling question of the "overrepresentation" of Hungary in many branches of modern science. It does not analyze the political and social forces which hampered scientific developments and which resulted in the exodus of a large number of Hungarian mathematicians, physicists, sociologists, and economists during the pre-World War II period. Among the small nations, Hungary has been one of the major "exporters" of scientists to the more advanced countries—for example, John von Neumann, L. Szilárd, E. Teller, E. Wigner, Th. von Kármán, A. Szent-Györgyi, G. von Békésy, G. von Hevesy, R. Bárány, the Polányis, and K. Mannheim. Five of those named are Nobel laureates.

The book shows in some detail recent efforts to broaden the institutional and social base of science, to coordinate research on a national basis, and to make science out of the individual activity of a few dedicated men into an integral part of Hungarian culture. The current momentum in research, reinforced by the widening international contacts and the end of the ideological dogmatism of the Stalinist cast, promises a bright future for science in Hungary.

Science in Hungary is the first undertaking of its kind made available to an international audience. It should assist persons interested in the developments in science and the intellectual history of Hungary. An index would have made the book more useful.

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Theoretical Physics

The essays assembled in this volume, **High Energy Physics** (Gordon and Breach, New York, 1965. 521 pp., $10.50), edited by C. DeWitt and M. Jacob, are the lectures delivered at Les Houches during the Summer School of Theoretical Physics in 1965. With one exception they are devoted to the two most actively pursued methods in the theory of strong interactions of fundamental particles: S-matrix theory and group theory. But the exception is an important one. After the discovery of parity violation in weak interactions of elementary particles in 1956 (to be precise, the parity as defined by strong interactions, for the meaning of discrete symmetries like parity P, time reversal T, and charge conjugation C, depends on the type of interaction), it was generally believed that the time reversal invariance is still an exact symmetry; so is CP, because, on the basis of some very general principles the product, CPT is expected to be an exact symmetry. The experimental discovery in 1964 by Christenson, Cronin, Fitch, and Turlay of the decay of long-lived K_0-meson into two mesons, $\pi^+\pi^-$, indicates that the time reversal invariance, as is used now, must be violated in some of the interactions entering the above reaction. As a result, the possibility of a breakdown of time-reversal symmetry has been reconsidered in all types of interactions. In his lecture, J. S. Bell not only discusses these questions, but also provides an excellent review of the whole theory of weak interactions, including experimental comparison of various phenomenological principles of which this theory has an abundance.

The background of the use of the S-matrix and group theoretic methods in high energy physics has been discussed in detail in *Science* [**144**, 698 (1964)