Standardized, Precise Tool

Methods of Tissue Culture. Raymond C. Parker. Harper, New York, ed. 3, 1961. xv + 358 pp. $12.

The 11 years that have elapsed since the publication of the second edition of Parker's manual have witnessed a series of revolutionary changes in tissue culture techniques, which have produced a standardized tool of great precision. The third edition includes and admirably describes the new technology, including treatments of chemically defined media (chapter 6), the preparation of cell suspensions (chapter 8), monolayer culture (chapter 11), suspended-cell culture (chapter 12), cloning procedures and plating techniques (chapter 13), virological procedures (chapter 16), growth measurements (chapter 17), and frozen storage of cell lines (chapter 18). These innovations comprise the body of what may properly be called cell culture.

Although they have not received the general attention accorded the foregoing, several important modifications of older tissue and organ culture techniques have been developed within the last decade, and they have been incorporated into this edition. Among these are the use of reconstituted collagen in place of plasma clot (chapter 10), organ culture on liquid media (chapter 15), culturing on membrane filters (chapter 15), and "organ" culture of reaggregated dispersed cells (chapter 15). Those sections dealing with the logistic aspects of tissue culture (that is, cleaning, sterilizing, media preparation, and the like) have been considerably amended to conform to the recent improvements in these procedures.

The revision has been accomplished by judicious weeding out of obsolete methods, but obsolescence seems to have been judged primarily by whether or not a better method has been developed rather than by what is currently fashionable. Those investigators who have "found the spot" may find this objectionable, but it should be appreciated by those of us who are still searching. In its present edition, this book covers the widest range of techniques adaptable to the many questions which dictate examination in vitro. Any one investigator may have recourse to only a limited number of them today, but since one can never predict with certainty where the search will lead, it seems wise not to prematurely narrow the selection.

To create the impression that this is a mere "cookbook" would be a grave injustice to the potential reader. As in the previous editions, techniques are discussed with reference to their application and to the information that they have yielded, which, after all, is the proof of any pudding. Parker's long association with and achievements in this area eminently qualifies him for the role of "taster."

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Journalism and Biology

The Ideas of Biology. John Tyler Bonner. Harper, New York, 1962. xi + 180 pp. Illus. $4.95.

The Ideas of Biology is not a textbook, according to the author's preface, but something else:

"The main purpose of textbooks is to present the facts in as simple and orderly a fashion as possible so that the student can learn them and keep them straight. The main purpose of this book is to assume this basic information and then to stand off as far as possible and see what it means. This is a book on the ideas rather than the facts of biology, although, of course, the ideas have the facts as their foundations."

The reader is thus led to expect a mode of analysis—philosophical?, methodological?—that has the power to endow the subject matter of biology with meanings not to be found in the pages of ordinary textbooks.

The six chapters of the book—self-evidently entitled "The cell," "Evolution," "Genetics," "Development," "Simple to complex," and "Man"—do not fulfill this expectation. The author engages in no special kind of analysis but merely *recounts*, in discursive and somewhat popular fashion, some areas of special interest to biologists. Only its greater generality or the absence of technical detail distinguishes the volume from the usual textbook, and the hinted-at extra dimension of meaning, if present, is undisplayed.

The style, as in all of John Bonner's books, is vivid, graceful, and clear. A few oddities are conspicuous, one example being the claim that development is synonymous with gene action, and another being the assertion that cells have been shown to be no more than bags of heterogeneous chemicals. But these and other slightly unveridical statements may be regarded as stylistic devices designed to lend emphasis or exuberance to the narrative, and they do not detract markedly from an otherwise skillful presentation.

The main body of the book is followed by excellent suggestions for further reading and by a glossary-index. The latter is generally satisfactory, but contains at least one logical circularity, because *antigen* is used to define *antibody* and then *antibody* is used to define *antigen*.

The author makes the reasonable claim that his book might be useful to students as supplementary reading during the latter half of a first-year biology course. But the advantages to be gained are probably not of the sort the author intended. The advantages are those that accrue to good journalism. The journalist of biology and the writer of biological textbooks, however, have aims that are similar: both present the facts in an order imposed by the explanatory ideas available, that is, both try to lead their readers to see what the basic information means by exposing them to a body of theory that accounts for it. Is there another way?

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A Matter of Approach

Integrated Basic Science. Stewart M. Brooks. Mosby, St. Louis, Mo., 1962. 507 pp. Illus. $7.85.

The novel feature of this superior book, which is devoted primarily to the biological sciences, is its presentation of concise summaries of basic physics, basic inorganic chemistry, and basic organic chemistry at the very start. Upon this foundation of the physical sciences, the author then erects a rich, up-to-date, and quite sophisticated exposition of biology, largely in the form of human physiology. Brooks is a lucid and scholarly writer; his exposition is clear, fluent, and compact, and his knowledge of the vast subject matter he covers is thorough and intimate. Whichever section of this encyclopedic survey of the physical and biological sciences is singled out, it will invariably be found to be well written, rich in content, and up to the latest in the field.

As a textbook in human biology, it is as modern and packed with data as one would hope for, as interesting as any available text, and almost indispensable as a reference aid to all elementary biology teachers, because of its extensive and up-to-date coverage. Another feature of special value, in addition to its physicochemical foundations, is the list of pathologies appended to each chapter, whether the chapter deals with muscle, nerve, skin, bone, glands, or digestion. True, heredity, ecology, behavior, and experimental embryology are omitted, but no one would cite this in complaint. However, the issues that this specific approach raises are of another character. One cannot but wonder whether this volume has been pretested to establish whether so much precooked and ready-to-serve material can be consumed and digested by the beginning student. Moreover, should science be taught in this manner, without providing any historical perspective for the questions raised, the theories offered, discarded, accepted, modified, and challenged, or the controversies stirred up between such giants as Pasteur and Liebig, for example, which reveal the very essence and drama of growth and evolution in science as well as the meaning of theory and truth? Should the student memorize these thousands of facts with no motive, no evidence, no challenge, and, above all, with no knowledge of how they came to be established and upon what foundation they rest? Ultimately, each teacher must choose the kind of text that suits his outlook and attitude.

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Russian Genetic Elysium

Problemy Radiacionnoi Genetiki. N. P. Dubinin. Gosatomizdat, Moscow, 1961. 468 pp. Rub. 1.84.

A book on genetics published in the Soviet Union is interesting in two ways. First, and most obvious, one looks for the facts and ideas contained in the book. Second, because for about a quarter of a century the Soviet Union has discriminated against genetics and favored theories that elsewhere have long been considered obsolete, one looks for the denouement of this weird story. In this book Dubinin, who is probably the outstanding living Soviet geneticist, reviews a tremendous amount of information (the bibliography contains 886 entries, 186 of them in Russian and the remainder in other languages, chiefly English), and he casts off Lysenkoist pseudogenetics like a bad dream.

The first chapter (81 pages) is a masterfully condensed exposition of the basic facts and principles of transmission genetics, cytogenetics, and molecular genetics. This is followed by a discussion of the physical nature of radiations (36 pages) and by a long chapter (112 pages) on the genetic effects of ionizing radiations. The remaining chapters are shorter and deal with the genetic effects of ultraviolet and of visible light, the radiation genetics of mammals including man, and the applications of radiation genetics in agriculture, and "Concluding remarks." Population genetics, particularly of *Drosophila*, is scarcely mentioned; this is a conspicuous omission, especially so for an author who has been one of the pioneers in and major contributors to the field. Despite this glaring omission, the book gives the most complete and up-to-date presentation of radiation genetics available, to my knowledge, in any language.

In a book review it is futile to try to summarize the contents of a book that is itself a summary. Suffice it to say that the book is full of interesting facts, interpretations, and ideas; as the author is well aware, some of the ideas will stand the test of time, others probably will not. For example, Dubinin considers human genetic materials to be far more sensitive to radiation damage than those of *Drosophila* or mice. His basis is chiefly his own work and that of his collaborators—M. A. Arsenieva, G. G. Tiniakov, Julius Kerkis, and L. A. Lebedeva—on chromosomal aberrations produced by radiations in the rhesus monkey and in tissue cultures of human cells. From these and other data, he deduces that the doubling dose for genetic changes in man is in the neighborhood of 10 r, a very low value. He then argues that the estimates of the genetic damage in man, based on studies in mice, are unsafe, and he strongly urges the need for "studies on the radiation genetics of monkeys and apes, the animals most closely related to man." At the same time, Dubinin is hopeful of eventually discovering methods of "therapy and prophylaxis of both the physiological and the genetic radiation damage."

The most remarkable and engaging quality of the book is perhaps its consistent and sober optimism. The leitmotiv is this: "Modern experimental genetics has created a new base for the discovery of future powerful methods of directed transformations of the heredity of organisms. . . . Without doubt, when the nature of the chemical coding of genetic properties becomes known, and chemical and physical methods of directed change in the molecules of nucleic acids are worked out, man will have gained an instrument for controlling living nature. By changing the relative positions of the atoms in the molecules of genetic materials, man should be able to create at will the desired new forms of plants, animals, microorganisms, and viruses. This is a way towards radically new solutions of the problems of selection."

Dubinin does not suggest that, in his genetic Elysium, desired new forms of humans may also be obtainable. Possibilities that this may open up surpass the limits of imagination of even the most optimistic geneticists.

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Panoramic Overview

Biennial Review of Anthropology, 1961. Bernard J. Siegel, Ed. Stanford University Press, Stanford, Calif., 1962. 338 pp. $7.50.

This second biennial review of anthropology covers the period from 1957–58 to about mid-1960, though, like its predecessor, it does not deal with all aspects of the discipline.

Two chapters—on peasant life studies by C. Geertz and on the anthropology of development by Vera Rubin—deal with a major current focus: the impact of urban-industrial systems on the world's peasant communities. Although the study of primitive tribal groups has not been abandoned altogether, applied or "action" anthropology is increasingly concerned with cultural change in the far more populous peasant societies. A. F. C. Wallace and R. Fogelson survey the research on culture and personality, now less avant-garde than a generation ago, and also now involved in action programs, from public health to education. These studies overlap into