mollusks, and the vertebrates. A remaining resistance against accepting morphological continuity in mammals is no longer necessary since N. B. Everett's work on the mouse (*J. exp. Zool.*, 1943, **92**, 49–91).

Regarding the supposed origin of sex cells (gonocytes) from the germinal epithelium, Bounoure writes the following: "To this question many workers have answered in the affirmative; but their arguments are derived from *pure observations* (italics, C. G.) and usually consist of the supposed existence of transition stages of coelomic cells into germinal cells." These transition stages are really slices inevitably obtained by sectioning the large germ cells.

The second volume discusses asexual reproduction as it applies to germinal continuity. After evaluating a great many data concerning those forms in which asexual reproduction is best illustrated, the author shows that the germ cells are involved in both sexual and asexual reproduction.

The discussion of the law of the restriction of cell potencies, begun in the first volume, is forcefully and convincingly developed. Bounoure states: "One of the most important results of tissue culture is to *have demonstrated the irreversible character of cellular differentiation.* The consequence of these results destroys every hypothesis which attributes to cells *in physiological isolation from the organism,* the possibility of reverting to the embryonic state and to acquire through this reversion new and greater potentialities." These conclusions are of great importance to the cancer problem.

There are 555 references in the first volume and 171 in the second, but no indexes.

CHARLES GURCHOT

The John Beard Memorial Foundation,
642 Capp Street, San Francisco

The chemistry of heterocyclic compounds. Avery A. Morton. New York: McGraw-Hill, 1946. Pp. vii + 549. (Illustrated.) $6.00.

The literature of heterocyclic chemistry, barring the publications of original investigators in the field, is confined to a relatively small number of specialized monographs and a variety of survey chapters in some of the larger works on organic chemistry. This book is a contribution which has not been attempted previously; it is a textbook of heterocyclic chemistry and will prove useful in presenting graduate courses in that subject. The book is not intended as a reference work, but the comprehensive manner in which it reviews the third broad division of organic chemistry, and the representative quality of the numerous literature citations, make it a work of interest to organic chemists generally.

The material is arranged in classical order, oxygen and sulfur heterocycles preceding the more numerous nitrogen compounds, simpler ring systems being followed by structures of increasing complexity. Most of the chapters are prefaced with historical remarks of human interest, after which the nomenclature, preparation, and reactions of compounds containing the ring system under discussion are introduced. Descriptions of representative compounds and a selection of problems follow. Emphasis is placed on natural products, and the compounds selected for description either occur naturally or are of theoretical significance. The problems are a welcome addition to a text of this type and alone cover an appreciable part of the literature. Many of them reconstruct syntheses which have been realized experimentally, while others illustrate degradative methods of structure determination. Statements of problems include a starting material, a sequence of reagents, the composition of the final product, and a reference to the paper in which the reactions are described.

The typography of the book is identical with that of preceding volumes in the International Chemical Series. Misprints are few and self-evident, although errors like parabamic for parabanic acid (p. 462) could prove misleading. The use of a large R for a condensed benzene ring, "to focus attention on the heterocyclic chemistry of a synthesis," is initially confusing and without increased significance. Analytical applications are mentioned for many of the compounds described, and the omission of a substance like picrolonic acid is surprising. Not all heterocyclic compounds are difficult to prepare, and the ready availability of some of them compared with similarly constituted but theoretically simpler carbocyclic and aliphatic substances is of general interest. The accessibility of many unusual aliphatics and aromatics through syntheses involving heterocyclic intermediates is just touched (pp. 130 and 431).

FRED E. SHEIBLEY

University of Kentucky, Lexington

The prolongation of life. Alexander Bogomolets. (Translated by Peter V. Karpovich and Sonia Bleeker.) New York: Duell, Sloan & Pearce, 1946. Pp. xvii + 98. $1.50.

The Russian edition of Bogomolets' *The prolongation of life* has been read by several million people, and brief popularizations of phases of his work have appeared in the *Ladies' Home Journal* and in *Reader's Digest.* In making available this translation to the non-Russian reader, its purveyors astutely preface the work with the statement that they act "merely as transmitters." The author, the late Alexander Alexandrovitch Bogomolets, was president of the Ukrainian Academy of Sciences, founder and director of the Kiev Institute of Experimental Biology and Pathology, and recipient of a Stalin Prize, first class (March 13, 1941).

Since this book is primarily a popular essay on the subject of aging, no attempt is made to present a critical discussion of antireticular cytotoxic serum (ACS).

The bibliography of the text is very limited, and none of the work on gerontology in the English language is quoted. Nine different allusions, however, are made to Hufeland's 1796 edition of *Makrobiotik, oder die Kunst, das manschlice Leben zu verlängern* (translated into Russian in 1852). Most of the data on specific cases of longevity are quoted from the pages of *Izvestia, Pravda,* or the newspaper *Communist.* There are other miscellany on examples of longevity in plants and animals. While these data cannot be accepted as scientific material, they are of such a nature as to endow the manual with some value as a source book for *curiosae* on longevity.

Regardless of the validity of Bogomolets' hypothesis, his popular manual can serve only to perpetuate among the laity an alarming quantity of pseudo science and old wives' tales. On page 26 he writes: "I stated a long time ago that cancer cannot develop in an organism if the reticulo-endothelial tissue has retained a sufficient degree of resistance." Since the occurrence of cancer is then accepted *ipso facto* as an indication of the failure in resistance of the reticulo-endothelial system, Bogomolets' statement seems to mean no more than that, for