Book Reviews

Neuere Probleme der Abstammungslehre — Die transspezifische Evolution. Bernhard Rensch. Ferdinand Enke Verlag, Stuttgart, ed. 2, 1954. xi + 436 pp. Illus. Paper DM. 47.00; cloth, DM. 49.20.

Practically every chapter and subchapter of Rensch's book on "trans-specific evolution," that is, the origin of systematic categories higher than the species, ends with a sentence that sounds approximately like this:

> In summary we can conclude that the reviewed evidence shows that the considered evolutionary event can be explained in terms of the factors responsible for intra-specific evolution (mutation, changes in population size, selection, isolation). There is no reason to assume that other autonomous internal factors have been at work.

Since these statements come from one of the world's leading zoologists who at one time was a convinced Lamarckist and later has probably contributed more than anybody else to establish the importance of geographic variations within the species in his classical work on *Rassenkreise,* the statements certainly do carry a great weight for anyone who is interested in the study of evolution.

This is the second enlarged edition; the book originally appeared in 1947. Even though the general plan has not been basically altered, several chapters have been entirely rewritten and others have been added. Trans-specific evolution is considered from two main aspects: "cladogenesis," that is, the branching of phyletic lines, and "anagenesis," that is, the origin of progressive changes, of higher more complex structures. Problems of general significance for biology, such as evolutionary rates, irreversibility of evolution, origin of new organs and of morphological correlations, orthogenesis, degeneration and extinction of phyletic branches, increase of complexity in the structure of organisms, and the like, are discussed with great originality, with the evaluation of an imposing amount of pertinent data. Chapters dealing with problems to which the author and his school have made personal contributions are particularly noteworthy. Remarkable among these is a discussion of the significance of allometric growth for evolutionary advances based on very recent investigations carried out at Rensch's laboratory at the University of Münster. Stimulating, too, are other chapters of a more speculative nature, such as that on the possibility of existence and evolution of living things on cosmic bodies other than the earth and that on the origin of the phenomenon of consciousness and cognition (*Bewusstseinerscheinungen*).

The significance of Rensch's contribution to evolutionary literature lies, I think, in the fact that it provides a thorough discussion from a modern viewpoint of problems of evolution as approached by a morphologist studying living fauna. These have previously been presented by Dobzhansky from the viewpoint of the geneticist, and therefore dealing primarily with variation at the subspecific level; by Simpson from the viewpoint of the paleontologist, and therefore dealing primarily with the major features of evolution observed along the time axis; and by Mayr from the viewpoint of the systematist, and therefore dealing primarily with speciation and the origin of taxonomic categories.

In this book we find a very learned and novel discussion, especially for the American reader, of most of the classic problems of morphology that have aroused the doubts of many biologists concerning the validity of the Darwinian theory of natural selection for explaining evolutionary events. It is indeed gratifying to see how convergent conclusions can be drawn starting from such different viewpoints and experiences. The value of genetic mechanisms in explaining morphological correlations could possibly have been presented in a more forceful way had recent work on polygenic inheritance and on correlated responses under selection been considered. As it stands, however, this book is certainly very important at the present stage of development of evolutionary studies. A translation into the English language would be very valuable.

At a time when even scientists seem to favor the intervention of mysterious, unanalyzed, and often unanalyzable, almost mystic factors to explain natural events, it is indeed refreshing to read such a clear, down to earth discussion of the major problems of biology carried out with a detached and healthy scientific attitude.

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The Mind and the Eye. A study of the biologist's standpoint. Agnes Arber. Cambridge Univ. Press, New York, 1954. 146 pp. $3.

The author of this group of essays is a well-known British botanist who, nearing the end of her active service, lays before us these studies of the basic assumptions, investigational methods, and modes of written description currently accepted among biological workers, together with her conception of the metaphysical and philosophic implications of her science. Part I deals with the nature of biological research, the choice of a problem, the mode of discovery, the interpretation of data, the validity of conclusions, and the writing of reports. Part II carries the argument to higher levels, with examination of the bases of scientific thinking, of fundamental assumptions in biological research, of the role of antitheses in the description of problems, and of the value of metaphysical and philosophic theories in interpretation. The author illuminates her argument with many

biological examples, often chosen from her own discipline. She quotes frequently from the literature of philosophy. The style is clear and precise, giving a sense of deep sincerity in a search for an understanding that will transcend appearances and find unity in the midst of diversity.

The concluding chapter, setting the theme for the whole book deals with the relationships between sensory impressions and the higher mental life. The author writes:

> Kant . . . wrote that it is essential for the achievement of abstract thought "to emancipate the mind from the despotism of the eye." To speak of "despotism" in this connection, prejudices the case from the outset; it is an unfair word, since the eye is, rather, the servant of the mind, to which it offers all its data for interpretation. . . . The activities of the sense organs, and the thinking of the brain, are all parts of an indivisible whole. . . . Whereas *Metaphysics* studies "being" as such, and *Natural Science* (of the physico-chemical type) treats of the corporeal world, *Natural Philosophy* may be so defined as to link the two; it would connote that mental activity which ceaselessly weaves connexions between the planes of intangible "essence" and tangible "existence."

The professional philosopher may find little novelty in the development of such ideas, but the biologist, usually immersed in the minutiae of observation or experiment, will do well to read this modest volume. Provisional and imperfect it surely is, as the author well knows, but it points a way toward deeper thinking about basic causes and meanings which most biologists have lost. She hopes that

> . . . its very inadequacies may stimulate others to cast an illumination, more powerful than my rushlight, upon the biologist's road to reality.

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Relative Chronologies in Old World Archaeology. Robert W. Ehrich, Ed. Univ. of Chicago Press, Chicago, 1954. xii + 154 pp. Illus. Paper, $2.50.

These papers were originally presented at a joint symposium of the American Anthropological Association and the Archaeological Institute of America. Nine specialists from different regions attempted to build up a chain of chronological equations that would enable the student of comparative archeology to estimate the relative age of various cultures and to observe the contacts between them.

The assignment was an ambitious one and difficult to follow in the original, oral presentation. The carefully edited book that has resulted is an invaluable tool for the professional archeologist and an interesting demonstration of method for outsiders. Highly recommendable is Helene J. Kantor's opening paper on the situation in Egypt, cornerstone of any chronological construction, whether relative or absolute, in the ancient world. From here we wander through Palestine along a system of safe throughways to Northern Syria and Anatolia (where R. J. Braidwood and Hetty Goldman unveil new and precious footholds). We begin to feel somewhat uncertain as we turn west into the Aegean and become lost in Europe, only to be rescued by the vigorous editor.

The other road leads east, into safe and relatively well explored Mesopotamia, on via Iran into the depths of China. Here a remarkable contrast occurs. Where contacts are rather unknown, the layman will have little trouble in following the story (China). Where precise knowledge is beginning to accumulate (Iran), the account becomes highly technical and appetizing for experts only.

Attention is focused on *relative* chronology, a wise procedure. The material used is the everyday equipment of ancient man; witness the pots all over the text and cover of the book. There are moments when one would like to see *art* introduced into the story; after all we do have sculpture to tell us about Mesopotamia and North Syria. But the everyday criterions, when handled with circumspection as they are in the best of these papers, have allowed old world archeologists to resuscitate and articulate the world of early human progress.

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Biochemistry and Human Metabolism. Burnham S. Walker, William C. Boyd, and Isaac Asimov. Williams & Wilkins, Baltimore, ed. 2, 1954. xii + 904 pp. Illus. $10.

By changing the classical order of the topics of study, placing greater emphasis on proteins and amino acids, and by accenting human biochemistry rather than organic chemistry, the authors of *Biochemistry and Human Metabolism* have successfully combined the fundamentals of biochemistry with its clinical applications. The general plan of the first edition was not altered except for some minor changes, such as the inclusion of the section on acids and bases in the first chapter rather than in the appendix. The Brønsted-Lowry concept of acids and bases is concisely explained and utilized to correct the prevalent though erroneous view among some clinicians that sodium or potassium ions are bases. Chapter 14 on "Proteins and starvation" has been completely rewritten and considerably enlarged.

Although protein and enzyme chemists may be enthusiastic about the prominent place given to these subjects, the need for a 40-page chapter on "Reproduction and heredity" and a 22-page chapter on "Cancer" in a biochemistry textbook may be questioned, especially when lipids and lipid metabolism are discussed in only 16 and 20 pages, respectively.

Typographical errors are, in general, rare. It is anomalous that *amid* is used for *amide* (p. 91), while the now outdated *tryptophane* for *tryptophan* is still