further particulars are wanted the undersigned will be glad to supply them.

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OCCURRENCE OF THE MALONE AND TORCER FAUNAS AT THE BASE OF THE ARIZONA COMANCHEAN

THE stratigraphic problems associated with the interpretation of the Upper Jurassic–Lower Cretaceous sequence of the Malone district in Texas are well known. Briefly summarized, in 1905 Cragin described as the "Malone formation" strata near Malone, Texas, that contain ammonites and lamellibranchs.[1] He interpreted the entire assemblage of the Malone fossils as belonging to the Upper Jurassic. The Jurassic (Kimmeridgian) age of the Malone ammonites, collected by Cragin, was upheld by V. Uhlig and later by L. F. Spath. In 1926 F. L. Kitchin demonstrated that the *Trigoniae* described by Cragin could not be of earlier age than Valanginian (earliest Cretaceous) and emphasized that there was no proof that all of Cragin's fossils came from a single horizon.[2]

W. S. Adkins, therefore, restricted the term Malone to the Jurassic part of the section of central Malone Mountain near Torcer station on the Southern Pacific Railway west of Sierra Blanca, and introduced the name Torcer for the Cretaceous (Neocomian) portion of Cragin's "Malone formation."[3]

In the lower part of the Cretaceous sequence near Bisbee, Arizona, there are limestone beds that contain abundantly represented and well preserved specimens of *Trigonia vyschetzkii* Cragin, *Trigonia calderoni* (Castillo and Aguilera), *Trigonia goodelli* Cragin, *Trigonia proscabra* Cragin, *Pleuromya inconstans* Castillo and Aguilera, *Astarte* (*Eriphyla*) *malonensis* Cragin, *Exogyra potosina* Castillo and Aguilera and other lamellibranchs described by Cragin from the Malone area. The conditions of deposition apparently were the same as at Malone, and forms referred by Cragin to *Astrocoenia* and *Serpula* are found in abundance. Immediately above these limestone beds are cross-bedded sandstones and fresh-water-laid sandstones with large silicified tree logs. In the younger argillaceous limestones *Dufrenoya texana* Burckhardt, marking the Upper Aptian (Travis Peak), is found.

About 500 feet below the Trigonia beds are grits alternating with sandstones and impure limestones. The grits yield *Idoceras schucherti* (Cragin) which demonstrates the Kimmeridgian (early Upper Jurassic) age of these strata.

A detailed account of this find will be published in the near future.

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SCIENTIFIC BOOKS

ANATOMY OF VERTEBRATES

The Microscopic Anatomy of Vertebrates. By G. G. SCOTT and J. I. KENDALL. 306 pp., 167 figs. Lea and Febiger, Philadelphia, 1935.

THIS is an elementary treatise on vertebrate histology that is designed to fit a college course one semester in length. For this reason the descriptions have been kept brief and relatively simple, although by judicious elimination of minor detail and justifiably dogmatic presentation a surprisingly large amount of information is made accessible. The style is clear and readable and the arrangement of text-matter logical. There is an adequate index.

The illustrations, mostly original, are partly unlabelled photomicrographs and partly line drawings. The former are rather good in comparison to the natural limitations of this ideally desirable but practically disappointing medium. The line drawings make no pretense toward the faithful portrayal of cell, tissue or organ structure but exist as diagrams which serve in a stylized way as keys to what might be found in actual preparations. No magnifications are given, since the authors believe college students incapable of comprehending such magnitudes. To the reviewer this seems a definite shortcoming and a palpable libel on collegiate intelligence. But even admitting that a college student can not visualize what is implied in an illustration being enlarged 10, 100 or 1,000 times the original size, it still is true that such information allows one to judge of relative size by knowing that certain drawings were made in the ratio of 200 to 400 units, and so on. Nevertheless, the authors state that the student constantly using the microscope will have little difficulty in appraising the degree of magnification and that he can measure things mentally by the familiar artifice of using the erythrocyte as a yardstick. One wonders, however, if escape has not been made from one difficulty into worse ones. The degree of magnification, as judged by the eye, is something like stating the apparent size of the moon, while the correct sensing of the absolute value of the micron is probably harder than understanding magnification values. Moreover, in a comparative course the verte-

[1] F. W. Cragin, "Paleontology of the Malone Jurassic Formation of Texas," U. S. Geol. Survey Bull. 266, 1905.

[2] F. L. Kitchin, "So-called Malone Jurassic Formation in Texas," *Geological Magazine*, Vol. 63, pp. 454–469, 1926.

[3] W. S. Adkins, "The Mesozoic Systems in Texas," University of Texas Bull. 3232, pp. 286–291, 1932.

brate erythrocyte proves to be a unit of variable size, the largest thirty or more times the diameter of the smallest. In rebuttal the authors might perhaps argue that this is the best of training in preparation for an economic and social order in which one must pass trippingly from one sliding-scale standard to another!

Like the illustrations which are selected from various vertebrates, the descriptions are to a considerable extent comparative as well. It is anticipated by the authors that certain of the descriptions given will not fit accurately the specific laboratory material used in a comparative course, but this is held to be advantageous inasmuch as it emphasizes variability. There is a certain magnificence in such authorial nonchalance which, thus disclaiming further responsibilities, places the comparative foundling so neatly on the doorstep of colleagues whom they set out to aid. But practically the outcome could scarcely be otherwise, and for college students the drawing of study material from comparative sources has too much in its favor to be discarded for the single-type approach. An excellent feature is the inclusion of a brief bibliography at the end of each chapter to call attention to representative original papers in the more accessible journals (mostly American) and to serve as starting points for more extended collateral reading. With but few exceptions these reference articles are in English—a matter of sound practical judgment since American college students are singularly incapable of making effective scientific use of the foreign languages over which they have labored so long in the classroom. A final chapter gives instruction in the fundamentals of histological technique.

This book should prove a useful and reliable aid to those teachers of general college courses who find it impractical to make use of a more ambitious text. If the average college student actually finished his semester in microscopic anatomy with a fair fraction of the contents of this book verified and digested, then his instructor would have ample reason for jubilation.

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ZOOLOGY

Three books published during the year 1935 have been received for review. These include a condensed outline of biology, a new and original general textbook of biology and a laboratory manual.

An Outline of General Biology. By Gordon Alexander. vii + 181 pp.; Barnes & Noble, New York, $0.75.

This little outline reminds one of Selenka's Taschenbuch. It begins with a well-executed "quick reference table to standard text-books," which should be useful to students and teachers. There are four divisions in the body of the work: (1) life in its simplest forms, (2) multicellular organisms, (3) general principles and (4) human relations of biology. Two appendices are devoted to a rather unprogressive classification of plants and animals and a brief, carefully considered but at times inaccurate glossary. On the whole the outline is succinct, thoughtful, interesting, accurate, sensible and well written.

An Introduction to Biology. By Edward Loranus Rice. xii + 602 pp. Ginn and Company, Boston. $3.20.

This book, by a man who has for a generation been respected by zoologists as a successful teacher, is an excellent introduction. It has been written for the use of college students with the idea that "an elementary course in biology can not give a very extensive knowledge of fact; it can and should give an insight into the significance of biology and an appreciation of its spirit." The first three chapters discuss biology, protoplasm, cells, osmosis and other fundamental matters; seven chapters are devoted to man—life functions, alimentation, respiration, excretion, circulation, reproduction, motion, nervous functions and chemical coordination; eight chapters deal with the frog; and the remaining chapters are devoted to classification, earthworm, hydra, amoeba, unicellular plants, higher plants, comparison of plants and animals, food and oxygen cycles, evolution, heredity, variation, evidences and methods of evolution and human evolution. Three appendices include a table of equivalent weights and measures, a bibliography and etymologies for scientific terms. The book is the work of one who understands biology and loves students. It is original, thoughtful and well done.

Laboratory Guide in Animal Biology. By Robert H. Wolcott and Eugene F. Powell. vii + 101 pp. McGraw-Hill, New York. $1.00.

This is designed to accompany Wolcott's "Animal Biology." It is an unprogressive example of "type-study" ideals. Type animals from amoeba to frogs are described in order; with interpolated exercises on the microscope, maturation and embryology and mytosis. Detailed directions are given as to how students are to observe, dissect and draw. To the reviewer the guide seems to be rather poorly written. Such terms as "forms," "ones" and "highly developed" are often used loosely. As an example of careless thought the irrelevant questions under "Thigmotropic Responses" on page 31 may be cited. Perhaps a student in a scientific laboratory should have a chance at times to