Ammonoid Paleobiology 2.0—Fresh Views, New Concepts, Advanced Methods

Author: Wiese, Frank

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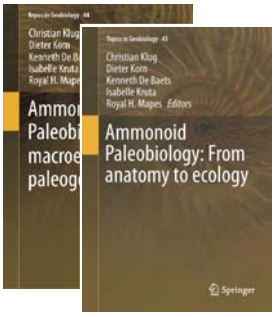

Christian Klug, Dieter Korn, Kenneth De Baets, Isabelle Kruta, and Royal H. Mapes (eds.) 2015. Ammonoid Paleobiology: From anatomy to ecology. *Topics in Geobiology* 43, 934 pp., 267 figs. (16 figs. in color). Springer Verlag. ISBN: 978-94-017-9629-3. Price 229.00 $ US Hardcover, 179.00 $ US eBook.

Christian Klug, Dieter Korn, Kenneth De Baets, Isabelle Kruta, and Royal H. Mapes (eds.) 2015. Ammonoid Paleobiology: From macroevolution to paleogeography. *Topics in Geobiology* 44, 605 pp., 176 figs. (57 figs. in color). Springer Verlag. ISBN: 978-94-017-9632-3. Price 229.00 $ US Hardcover, 179.00 $ US eBook.

"From anatomy to ecology" contains 21 contributions devoted to aspects of the conch, ontogeny, anatomy and habitat of ammonoids. In "From macroevolution to paleogeography", 20 chapters cover the topics macroevolution, paleobiogeography of ammonoids and ammonoids through time. Both titles were published one year after the 9th International Symposium "Cephalopods—Present and Past" (September 2014 in Zürich, Switzerland), and together with the symposium proceedings "Recent advances in Cambrian to modern cephalopod research, part I and II", available in the same year, a generation change amongst ammonoid workers becomes manifested. 1.539 pages with 41 contributions from 55 authors make the two-volume relaunch of the 1996 "Ammonoid Paleobiology" (eds.: Neil H. Landman, Kazushige Tanabe, Richard A. Davis) with "only" 857 pages voluminous. Comparing the content of both editions it becomes clear how much "ammonoidology" advanced the last two decades. Rigorous morphometric and statistical analyses of the conch and the embryonal stages advanced our understanding of shell growth, morphological disparity, species concepts, and morphospace trajectories in time and across extinction horizons considerably as expressed by numerous contributions in the new 2015 edition. New ideas about the formation of the septum are provided. Buoyancy calculations are advanced by using techniques such as computer, grinding and synchrotron/neutron tomography. Stable oxygen isotope analyses of ammonoid shells enable the reconstruction of the ambient paleo water temperatures, providing clues to ammonite habitats, and parasites and pathologies of ammonoids received their own chapter. Endocochleate experiments in ammonoids are included, and quantitative biochronology supplements the established biostratigraphic procedures methodologically. Certainly, the synthesis of the latest discoveries of ammonoids around the K–Pg boundary and the extinction of the Ammonoidea remains an exciting story. Finally, organic geochemistry finds its way into ammonoid taphonomy, supplementing the 1996 chapter considerably. More recent observations can easily be discovered in the individual chapters.

In such a compilation, not all aspects can be covered equally as it stands and falls also with the authors who are willing to provide contributions. No authors—no chapter, and this can explain some weaknesses in "From macroevolution to paleogeography", which appears to be a bit heterogeneous. Evolutionary trends of Triassic and Jurassic Ammonoidea face a short contribution on Paleozoic Ammonoidea, and the Cretaceous Ammonoidea are not treated at all. It is also interesting to see how basic the data compilations and/or interpretations still are in some disciplines: While Triassic paleobiogeography is based on data-base supported statistical analyses, Devonian, Carboniferous, Jurassic, and Cretaceous world-wide paleobiogeographic reconstructions have not yet really left the level of narrative approaches, indicating some stasis and the need of future studies. As numerous topics of ammonoid paleobiology from the 1996 edition needed to be also considered in the new edition, some redundancy inevitably occurs, but this is good and important to really provide holistic views on the respective topics. The wealth of new data and comprehensive reference lists witness impressively the huge progress of the last years and, likewise, offer the reader a bibliographic treasure chest as a starter for own literature research.

Irrespective of some minor weaknesses, these two volumes are a statement and an extremely valuable synthesis of the current state of the art of ammonoid paleobiology. Surely, like comparable compilations from the past, it also will be history in some years to come. However, the step from 1996 to 2014 shows how concepts and methods advance, and it is so exciting to see how much has been learned the last two decades about a group with an almost unknown soft body organisation. Ammonoid Paleobiology 2015 will remain surely a well-cited standard work for some time. But, even more exciting remains the question for the future: What will come up next in ammonoid paleobiology?

Both volumes are in robust hardback and printed on acid-free paper. Layout is good but printing quality not excellent, and some of the figures, especially colour photographs, show low resolution both in the printed copy and the ebook. The book is useful and inspiring for anybody interested in the Ammonoidea, and it should find its way into libraries of institutions focusing on the paleobiology of macroinvertebrates.

Frank Wiese [fwiese1@gwdg.de], Department of Earth & Environmental Sciences, Palaeontology and Geobiology, Ludwig-Maximilians-Universität München, Richard-Wagner-Str. 10, D-80333 München, Germany and Department of Geobiology, Geoscience Center, Georg-August-University Göttingen, Goldschmidtstr. 3, D-37077 Göttingen, Germany.

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