Imagine you belong to any religion and your chief deity asks you: “Could you imagine editing the new sacred book?” This is the feeling you have as an ammonoid worker, when you are offered to take care of the new edition of ‘Ammonoid Paleobiology’. Not only for us, who had the honor and burden of this gigantic task, ‘Ammonoid Paleobiology’ represented a comparably important book since we consulted it so often in order to better understand these organisms, which went extinct 65 million years ago.

Although many of the early ammonoid researchers of the nineteenth century have spent thoughts on the ammonoid organism and its mode of life, most of the major contributions to modern ammonoid paleobiology appeared roughly in the past half century. Looking at the scientific output of these decades, it appears like the first edition of “Ammonoid paleobiology” was a product of something like a golden age of ammonoid research. The two decades preceding its publication saw the first five international symposiums “Cephalopods—Present and Past” and many important articles by colleagues such as John Callomon, Antonio Checa, John A. Chamberlain, Larissa Doguzhaeva, Jean-Louis Dommergues, Jean Guex, Roger H. Hewitt, Michael House, David K Jacobs, Jim Kennedy, Cyprian Kulicki, Neil Landman, Ulrich Lehmann, Harry Mutvei, Takashi Okamoto, Bruce Saunders, Yasunari Shigeta, Kazushige Tanabe, Henri Tintant, Jost Wiedmann, Peter D. Ward. Gerd Westermann, Yuri Zakharov (incomplete list!) contributed essential data and interpretations, but they also stimulated further research in this field. Unfortunately, many important cephalopod workers and good colleagues have died in the last two decades. In 2014 alone, for example, Fabrizio Cecca, Adolf Seilacher, Helmut Hölder, Gerd Westermann, and Hiromichi Hirano passed away.

Due to fundamental changes in the structure of scientific communities including the dubious judgment of the value of scientific work by impact factors and citation rates, cephalopod research has changed as well. Additionally, the community of ammonoid researchers appears to have started shrinking. Nevertheless, the past decades still saw thousands of interesting contributions on representatives of this
fantastic clade. And still, we have a lot of work ahead of us prior to becoming able
to respond to all questions regarding ammonoid paleobiology.

So what is new? In terms of content, we have restructured the former into a
two-volume work with the main parts shell, ontogeny, anatomy, habit and habitats,
macroevolution, paleobiogeography, ammonoids through time, fluctuations in am-
monoid diversity, and taphonomy. Most of these parts are subdivided into chapters.
The great amount of 41 chapters reflects the panel of ammonoid workers pres-
ent nowadays in academia, junior and senior scientists from many countries and a
higher percentage of female authors compared to the previous edition. We aimed at
being as up-to-date as possible, which had the consequence that some chapters also
present unpublished specimens, data and results. We also included two chapters on
the geochemistry of ammonoid shells, a field that still offers vast possibilities for
new research. This is also reflected in the slightly different views presented therein.

Furthermore, we added an introductory chapter for the definition of terms and
with a recommendation for the description of new ammonoid taxa. We emphasized
the next challenges in ammonoid research such as reconstructing ammonoid phy-
logeny, understanding their intraspecific variability or reconstructing the soft parts.
Studying intraspecific variability has been widely neglected, but it offers a wealth
of possible implications for life histories, ontogeny, reproduction and, most im-
portantly, for evolution. In this context, another challenge is establishing a phy-
logeny for ammonoids, and thus, one part comprising five chapters is dedicated
to ammonoid macroevolution. In our eyes, paleontological data yield the essential
information for research on evolution. As pointed out already by Seilacher and El-
dredge, ammonoids are of particular interest due to their accretionary shell, which
has a good fossilization potential and hold a record of their life history, their high
evolutionary rates, their wide geographic distribution, high taxonomic diversity and
morphological disparity as well as their well-constrained stratigraphic (i.e., tem-
poral) framework. In the case of ammonoids, however, countless homoplasies oc-
curred throughout their evolution, thus hampering attempts to reconstruct ammo-
noid phylogeny. Nevertheless, a sound phylogenetic model for the ammonoid clade
should be one of the central tasks in ammonoid research because the knowledge
of ammonoid phylogeny is still patchy. Furthermore, although some quantitative
approaches have been pioneered with ammonoids (e.g., Raup’s morphospace, Oka-
moto’s growing tube model), such methods are still too little used in many stud-
ies on ammonoid paleobiology and evolution; many studies restrict themselves to
narrative discussions or qualitative assessments. For this reason, the application of
several quantitative and statistical methods to study many aspects of ammonoid like
biostratigraphy, biogeography, intraspecific variability, evolutionary trends, etc. are
explained and demonstrated in several of the chapters of these two volumes, in the
hope these methods will be used more widely in the ammonoid community.

Finally, we added new information obtained from tomographic data obtained
both from computer tomography and grinding tomography. The field of virtual pa-
leontology has just started to deliver ammonoid data, which are of special interest
in the studies of shell morphology, ontogeny, buoyancy, mode of life, and ultimately
evolution.
These two volumes would have been impossible without our wonderful authors, and especially the help of Neil Landman as well as Kazushige Tanabe. Additionally, we greatly appreciate the support of the army of reviewers, who are listed and thanked in the corresponding chapters. Naturally, our partners and families have been affected more or less from the additional time consumed by the preparation of the volumes, we apologize for that and thank them for all their patience, inspiration, and support.

Christian Klug, Dieter Korn, Kenneth De Baets, Isabelle Kruta, and Royal H. Mapes
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