



Special Issue: Hans Hess—A lifelong passion for fossil echinoderms

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The present special issue is dedicated to a very special personality, a person who had a life-long passion for palaeontology. Hans Hess, a world-renowned echinoderm specialist is no longer among us; this is in indeed sad news. Hans passed away peacefully last year after a battle against leukaemia. He was a pragmatic person; he even announced his lethal diagnosis in an e-mail to most of his peers. He, however, was not completely struck by this message; on the contrary, he told me that now he would not start new projects anymore but needed to finish several manuscripts that were “in the pipeline”.

I, myself, owe Hans so much, because he was one of my mentors when I was a young palaeontologist studying asteroids, brittle stars and crinoids and later on, a peer for discussions on fossil echinoderms when I was the director of the Natural History Museum in Basel.

Hans, who never ceased publishing excellent research in his long life, has now stopped to do so, it is a real loss. This is one of the reasons why we decided to edit a special echinoderm issue in the Swiss Journal of Palaeontology to honour his scientific work and his life.

It is noteworthy that this is the second special issue dedicated to Hans, the first was in honour of his 80th anniversary and constituted at the same time the first volume of the Swiss Journal of Palaeontology (2011).

This special issue came into being by writing to many personal “echinoderm friends“ and colleagues of Hans, who did not hesitate with their contributions for a fine accolade to Hans. We have arranged the volume according to the different echinoderm classes starting with Hans’ most favourite class, the Crinoidea. Hans has devoted the very last years of his life completely to this group culminating in the publication of the revised Treatise on Invertebrate Paleontology (Part T Volume 3 Crinoidea) co-

authored by Charles “Chuck” Messing (Hess and Messing 2011).

The special issue starts with a contribution about Hans’ life and passion for echinoderms by Walter Etter. As a curator of Invertebrate Palaeontology at the Natural History Museum in Basel, Walter Etter was in close contact with long-time volunteer Hans Hess.

Crinoidea

In the first article, Hans Hess and Ben Thuy have teamed up to take a closer look at the origin and evolution of a poorly understood crinoid group, the cyrtocrinids. They present phylogenetic, palaeobiogeographic and palaeoecological evidence that suggests a deep-sea origin of these crinoids that temporarily invaded shallow seas in the Early Jurassic. At the same time, this is the last contribution by the late Hans Hess.

Bill Ausich is evaluating the Disparida with a parsimony-based phylogenetic study. The Disparida exhibit forms with both simple and highly specialized morphologies. Some of the families can be consistently identified as clades whereas others remain ambiguous.

Tom Baumiller and Forest Gahn present a new study on an old case of parasitism, the association of crinoids with platyceratid gastropods. This contribution convincingly demonstrates that the gastropods diminished the growth rates of the crinoids. The negative impact of the parasites leads to an increased length of the hindgut that allowed the crinoids to absorb more nutrients.

Again Tom Baumiller now with Angela Stevenson reconstructs crinoid predation intensity by looking at two comatulids. They show that one of the species has a slightly higher predation intensity that is probably due to a response to tactile stimulation that leads to crawling deeper into their perch.

A neoichnological approach is taken by Krystov Brom, Kazuma Oguri, Tatsuo Oji, Mariusz Salomon and Przemyslaw Salomon who show crawling traces produced by the extant stalked crinoid *Metacrinus rotundus*. These

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crinoids produce characteristic traces that have a good preservation potential. They conclude that autotomization and relocation were already present in the Triassic stem-group isocrinids.

A very unusual crinoid stem is described as a new species *Trombocrinus hanshessi* by Steve Donovan, Johnny Waters and Mark Pankowski. The specimen comes from the Devonian of Morocco and displays some peculiar features. The mesistele grew in a convolute manner and the proxistele was adapted to elevate the crown. The overall morphology looks like a trombone, unique among Palaeozoic crinoids.

Hans Hagdorn, Fabrizio Berra and Andrea Tintori report on a Middle Triassic obrution Lagerstätte from the Italian Alps. The juvenile and semiadult crinoids are referred to *Encrinus aculeatus*. Comparison with the holotype and material from Poland leads to the conclusion that the species concept of the genus is critical.

Didier Merle and Michel Roux dedicate a new species, *Eocenocrinus hessi* to Hans. The specimen comes from the Early Eocene of the French Pyrenées and is associated with *Conocrinus romanensis* and *Democrinus londinensis*. *E. hessi* is probably the oldest representative of the family Phrynocrinidae and lived on hard substrate in water depths up to 300 m.

Charles “Chuck” Messing takes a closer look at the extant crinoid *Actinometra blakei*. With the support of three new specimens, recently collected in the Western Atlantic, he is able to demonstrate that *A. blakei* is in fact a junior synonym of *Comatula*. However, it does not conform with *Comatula* and is thus assigned to a new genus, *Hanshessaster*.

Andrew Tenny and Steve Donovan report on a Carboniferous crinoid *Amphoracrinus* with only four arms. As there seem to be no signs of infestations, a genetic flaw is suspected. The crinoid adjusted by arranging its other arms at a right angle for efficient feeding.

James Thomka, Carlton Brett, Troy Bole and Hunter Campbell bring us an accumulation of disparid crinoids from the Upper Ordovician to notice. They discuss the implications for the palaeoecology and taphonomy of crinoid “logjam” assemblages from the type Cincinnati of Ohio (USA) and show that unusual specimens can be still discovered even in well-studied assemblages.

Gary Webster looks at the fossil record of the Cromyocrinidae and Pirasocrinidae that replaced most of the camerate crinoids in the Late Palaeozoic. These dendrocrinid taxa became extinct in the Late Permian but occur worldwide and show a greater diversity than previously assumed because disarticulated ossicles are difficult to assign.

Ophiuroidea and Asteroidea

Andy Gale presents an in-depth study of fossil Pterasteridae. Tremasterids from the Middle and Late Jurassic of Switzerland are intermediate forms that are linked to the Korethasteridae that are related to the modern highly derived brooding “slime stars“. *Hansaster trimbachensis* and *Propteraster amourensis*, two new fossil taxa are described as basal Pterasteridae, thus tracing their origin back to the Middle Jurassic.

Well-preserved brittle stars from the early Late Cretaceous are described as a new species of the genus *Stegophiura*. With a comparative taxonomic analysis Yoshiaki Ishida, Ben Thuy, Masaru Kadokawa, Naoki Ikegami and Lea Numberger-Thuy can show that this new species is the oldest and only fossil occurrence of this genus.

Peter Müller, Gerhard Hahn, Christian Franke and Ben Thuy present a study on Devonian brittle stars from Luxembourg and Germany. The two new species are described on the basis of articulated remains and belong to the Palaeozoic stem-group family Protasteridae. Within the latter family the genus shows a combination of characters that are interpreted as being paedomorphic suggesting that this played an important role in the evolution of extant and extinct clades as well.

Ben Thuy, Lea Numberger-Thuy, and John Jagt report on an assemblage of ophiuroid ossicles from the Late Maastrichtian of South Carolina. Out of seven species, five are new and they provide an important expansion of the palaeobiogeography of these brittle stars. Furthermore, one of the new species represents the oldest fossil occurrence of the family Amphiuridae.

Echinoidea

Steve Donovan and John Jagt deal with a paleoecological conundrum. A holasteroid echinoid was encrusted by a large oyster that comes from the Maastrichtian Nekum Member of the Netherlands. By analysing the encrusting small and large oysters assigned to *Pycnodonte vesiculare* they infer a deteriorating quality of the incoming water with time.

Steve Donovan provides us with a new atlas of SEM photographs of echinoid spines from 14 of the most common tropical Western Atlantic species. Commonly, external morphology of cidaroid spines is used to assign them to different fossil taxa, but when it comes to determining them in thin section, this is of no help. Combined with a description of the internal stereom, this study aims to become a tool for different palaeontological studies in thin sections.

Atef Elattaar presents a new species of the genus *Hypselaster*, a schizasterid echinoid. *H. strougoi* comes from the Lutetian Medawar Formation of the Eastern Desert in Egypt. Apart from the Miocene occurrence of the genus in Morocco, no other records exist from Panafrika.

A complete echinoid corona from the Early to Middle Miocene of Sarawak is described as a new species, *Clypeaster sarawakensis* nov. sp. by Morana Mihaljević. Discovering a new *Clypeaster* taxon demonstrates that this area seems to be a hotspot for palaeobiodiversity since the Oligocene. The compilation of the Central Indo-Pacific echinoid “fossil record shows a rapid diversity increase at the Oligocene–Miocene boundary.

Cystoids

Christian Klug, Alexander Pohle, Steffen Kiel and Björn Kröger take a new look at the taphonomy of Swedish Ordovician cystoids. They found 13 size-sorted thecae trapped in an orthoconic cephalopod. The paper sets out to

discuss the rare occurrence and its taphonomic implications.

My special thanks go to Ben Thuy, Christian Klug and Daniel Marty and Steve Donovan who made it possible to produce this special volume by co-editing the scientific contributions and to all of the reviewers who have contributed to assure the high quality of the published articles.

...and finally a big farewell to Hans, you were an outstanding palaeontologist and a fine man.

References

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