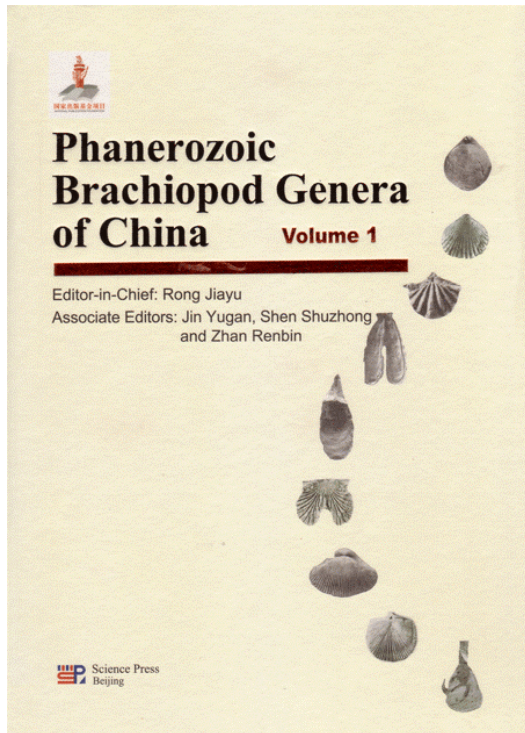




Book Review:

Phanerozoic Brachiopod Genera of China



RONG Jiayu (editor-in-chief), JIN Yugan, SHEN Shuzhong and ZHAN Renbin (eds.), 2017.

Science Press, Beijing, P.R. China, xviii + 1096 p. (2 vols.)

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Phanerozoic Brachiopod Genera of China, edited by RONG Jiayu (Editor-in-Chief) with the late JIN Yugan (deceased 26 June 2006), SHEN Shuzhong and ZHAN Renbin as associate editors, was published in two volumes in December 2017. This excellent work has contributions from 24 authors: 11 from the Nanjing Institute of Geology and Palaeontology (NIGPAS) and 13 from 11 universities and other institutes, mostly within China. This beautifully produced book is the result of 16 years of arduous work. It benefited greatly from a wide range of expertise and many years of research. It has 11 main chapters plus two useful indexes, one listing genera alphabetically, the other lithostratigraphic names. Each chapter has its own bibliography, taking up 76 pages of very small type, of carefully edited references, ranging from three for the introduction to 14 at the end of a chapter on Permian brachiopod genera. The references are exhaustive and will be a useful source of information for decades to come.

The 1096 pages in two volumes, printed on high quality paper, are attractively bound and lavishly illustrated by 443 high-quality text-figures (11 in colour) and 125 plates (seven in colour with some stunning photographs). Text-figures are abundant, ranging from drawings of shell

form, ornament and internal structures (including serial sections and reconstructions) to distribution charts and maps. The plates are excellent with exhaustive explanations (including magnifications) conveniently on facing pages. Consistency of style and format are maintained throughout.

Each volume has a detailed table of contents. The first volume has a Preface of 15 pages in Chinese by editor-in-chief RONG Jiayu, followed by an informative Introduction of 38 pages by the editors (with addition of QIAO Li and HUANG Bing) explaining the inspiration that led to this comprehensive work and associated projects that were spinoffs from this prodigious enterprise. The result is an elegant and exhaustive synthesis of all available information on Chinese brachiopod genera previously scattered through journals, conference proceedings, regional palaeontological atlases, and stand-alone monographs — supplemented by a modicum of injections of previously unpublished data.

Producing the vast corpus of its antecedent regional atlases of palaeontology of China was laudable but, being in Chinese, these were difficult for foreigners to use — especially when, after translation, there was little or no information about the discriminating characteristics of new



genera proposed. Such new taxa may have made their first appearance in fundamentally non-palaeontologic journals, for instance in journals primarily devoted to petroleum exploration or to local or regional geology. Such publications, when printed by local presses with very small print runs (which we refer to as 'fugitive publications') may be poorly represented in international libraries and perhaps even difficult of access far from the major centres of research in China.

Additionally, though some atlases may have a short English summary, many supposedly new genera and species may defy understanding of generic concepts (if any) contributed by the galaxy of authors who bravely contributed to those volumes. A further complication was that many authors, especially in far-flung institutes failed to adhere to the rules of nomenclature stipulated by the International Code of Zoological Nomenclature (ICZN, 4th Edition). This has been rectified meticulously in this remarkable two-volume work.

In the introductory chapter, the editors provide an excellent review of how brachiopod research developed in China from its very beginning. For many centuries, fossil brachiopods had, and continue to have, a place in popular Chinese medicine. The earliest record of this, dating from the 7th century, is a collection of annotations on 'shiyān' ('stony swallows', mostly Devonian spiriferides). There was no discussion about the possible origin of these, nor why when ground up and ingested they could have beneficial to the sick and dying.

Taxonomic study of Chinese fossil brachiopods was inaugurated by L.G. de KONINCK in 1846 with two new species, *Terebratula yunnanensis* and *Spirifer cheehiel*. E. KAYSER (1883) proposed the first new fossil brachiopod genus based on a Chinese species, *Leptodus*, for a grossly inequivalve productive brachiopod (family Lyttonidae), with *L. richthofeni* as designated type species (KAYSER, 1883). Since then, 762 brachiopod genera have been proposed with type species and type localities from China. During this period, stratigraphic correlations and brachiopod classification have undergone great changes. This prompted the comprehensive revision of all brachiopod genera from China presented in this book.

The authors of the Introduction divide studies on Chinese fossil brachiopods into four intervals, starting with a 'pioneering period', 1846-1923, when foreign specialists including de KONINCK, DAVIDSON, KAYSER, FRECH, LOCZY, TSCHERNYSCHEW, DIENER, WALCOTT, WELLER, GIRTY, MANSUY, YABE and HAYASAKA, published papers and stand-alone monographs on brachiopods from China ranging from Cambrian to Eocene in age. No Chinese students of fossil brachiopods emerged during this stage, but, following the works of SUN Y.Z., fossil brachiopods attracted the attention of Chinese

scholars, particularly ZHAO Y.Z., ZHU S., HUANG J.Q., TIAN Q.J., ZHANG M.S. and YIN Z.X. During this 'second stage' of brachiopod research in China (1924-1950), the American A.W. GRABAU (1870-1946) professor of geology at Peking University, made important contributions to the geology and palaeontology of China, producing major monographs on Chinese brachiopods as well as bivalves and gastropods. Prominent among other foreigners at that time who contributed to knowledge of Chinese brachiopods were COWPER-REED, de TERRA, GORTANI and MELAR, KOBAYASHI, ENDO, YABE, OZAKI, MINATO and HAYASAKA.

The editors inform us there was a great increase in mapping, and stratigraphic and palaeontologic studies of Palaeozoic rocks in China after 1950. Many new brachiopod taxa were proposed. In the 1960s, two inimitable Chinese professors, WANG Yu (1907-1984) and YANG Zunyi (1908-2009) inspired a flock of young Chinese scientists and teachers. Several of them became enthusiastic about brachiopods. As a result, in the second half of the 1970s and during the 1980s, a flood of new brachiopod genera was proposed, mostly published in regional palaeontological atlases of China's 23 provinces and five main autonomous regions. Contributions on brachiopods came from more than 50 palaeontologists. During this third stage, 1951-1990, two principal events brought a great number of brachiopodologists together for the First National Brachiopod Symposium in Hangzhou, Zhejiang Province, in 1980, and for the second such event held in Kunming, Yunnan Province, in 1985. The first with more than 100 participants, was attended exclusively by Chinese workers with two exceptions. One was the eminent American professor Arthur J. ('Art') BOUCOT whose influence on Chinese brachiopod research has been profound, paralleling that of the most prolific brachiopod worker of all time, G. Arthur COOPER, especially in the late 1950s and 1960s. An international symposium honouring Art was held in the Nanjing Institute of Geology and Palaeontology on 30 September 2004 (see *Palaeoworld*, Vol. 15, Issue 2, May 2006).

Since 1991, investigations on Chinese brachiopods have focused on taxonomy, resolution of stratigraphic problems and, *inter alia*, on emerging areas of studies in palaeoecology and palaeobiogeography. During this fourth stage (1991 to the present), a flock of new Chinese brachiopod researchers played an important role. The situation improved as more funds became available for basic scientific research by palaeontologists in various national institutions and ministries. Many papers on Palaeozoic and Mesozoic brachiopods were published during this period. Finally, in May 2015, the long-cherished dream of Chinese brachiopod experts was finally achieved



when the 7th International Brachiopod Congress, with the theme "The Brachiopod World", was held in Nanjing. In this well organized and attended Congress there were 53 speakers (21 Chinese), 30 poster contributions (10 Chinese) and publication of 108 extended abstracts by 195 authors from 24 countries. It was an immense international success.

The historical review in volume 1 of this masterwork is followed by an excellently illustrated chapter (mostly with colour illustrations) and comments on the general features of the brachiopod genera based on type species from the Palaeozoic and Mesozoic of China with numerical data, period by period: the number of genera in various provinces, the number of orders and genera in each period, the number of genera in each order, the number of brachiopod genera of China stage by stage, and numbers of Chinese genera proposed in five and ten year periods from 1883 to 2015. These data are followed by comments on the 'taxonomic treatment' — which follows the widely accepted systematic classification of the revised Treatise on Invertebrate Paleontology (KAESLER, 1997-2006; SELDEN, 2007). Of the 762 generic and subgeneric names compiled in the book, about 62% are regarded as valid, 17% as junior subjective synonyms, 3% as possible synonyms, 2% are homonyms, 2% objective synonyms, 11% *nomina dubia*, 6% *nomina nuda*. Taxa rejected from the phylum aggregate a mere 2% of the generic names that have been proposed for brachiopods (and supposed brachiopods) from China.

The introduction is followed by consideration of various questions including temporal distribution, palaeobiogeography (with separate sections for each of the nine geological periods, Cambrian to Cretaceous), macroevolution of the brachiopods of China, earliest diversification, radiations, mass extinctions, endemism, pandemic faunas (*e.g.*, the important *Foliomena* fauna), inorganic and organic factors controlling provincialism, notable climate and sea-level changes, geographic barriers, varying distances between plates, terranes and island arcs, tectonics, and stratigraphic/environmental backgrounds. Also important are observations made by the editors on the systematic framework followed in volume one (p. 39-557) and through volume two (p. 559-1096), on author and locality names, types, and on repositories of the type specimens of Chinese taxa. To avoid confusion among non-Chinese specialists who proposed species or other taxa before 1950, the names of Chinese authors are presented in the references using WEBSTER spellings. All references after 1950 are presented in Pinyin Chinese. Ten appendixes list homonyms, synonyms, *nomina nuda* and 18 proposed but rejected 'genera' of Brachiopoda, abbreviations, and loca-

tions of institutes including museums where type and figured specimens mentioned in the book are housed.

The remainder of volume one and all of volume two have separate chapters for each geological period, Cambrian to Cretaceous, with useful introductions followed by comments on geographic distribution, stratigraphic alignments, faunal succession, palaeobiogeography, and systematic palaeontology of the genera in them. Nine chapters in the systematic part specify type species, etymologies, diagnoses, discussions, species assigned and rejected, and the stratigraphic range and geographic distribution of all genera.

This much-needed and very informative book about one of the half-dozen most diverse phylum-level groups in the geological record is a delight for every worker, professional or amateur, devoted to the study of brachiopods. It is a superb result of the enormous energies of a vast number of authors, editors, illustrators and publishers. Just contemplating the monumental task of reading, digesting and organizing all the contributions is mind-numbing. Because it provides a complete and consistent database of all Palaeozoic and Mesozoic brachiopod genera based on Chinese material, it will have a long shelf life for amateur as well as professional palaeontologists. Sections of it will be cited authoritatively in palaeobiogeographic, biostratigraphic and evolutionary studies, and justly so. It is hard to find fault with this magnificent production.

Researchers in China and elsewhere can now readily access the entire Chinese brachiopod generic database with ease. We therefore heartily recommend this magnificent work to palaeontologists, geologists, biostratigraphers, biologists and even amateur palaeontologists interested in brachiopods, their systematics, biostratigraphy, biogeography and related topics.

The price of US\$225 may seem excessive, but this publication deserves to be within reach on every brachiopod worker's desk or bookshelf, either as a personal or departmental copy. Every brachiopod worker whose personal budget cannot extend to this amount should insist that it is vital for their institutional library to purchase a copy. No researcher involved in Palaeozoic and Mesozoic studies, especially palaeontologists, but even various 'Sinophiles' cannot fail to be impressed by this superb publication so elegantly produced by Science Press, Beijing.

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