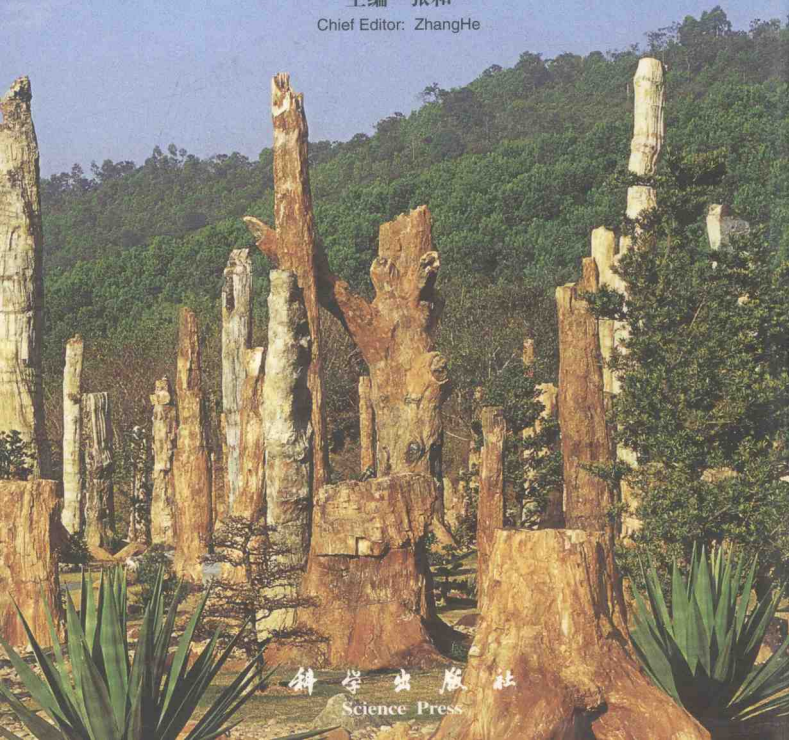
中国化石

The Fossils of China

主编 张和

Chief Editor: ZhangHe



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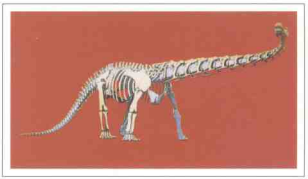

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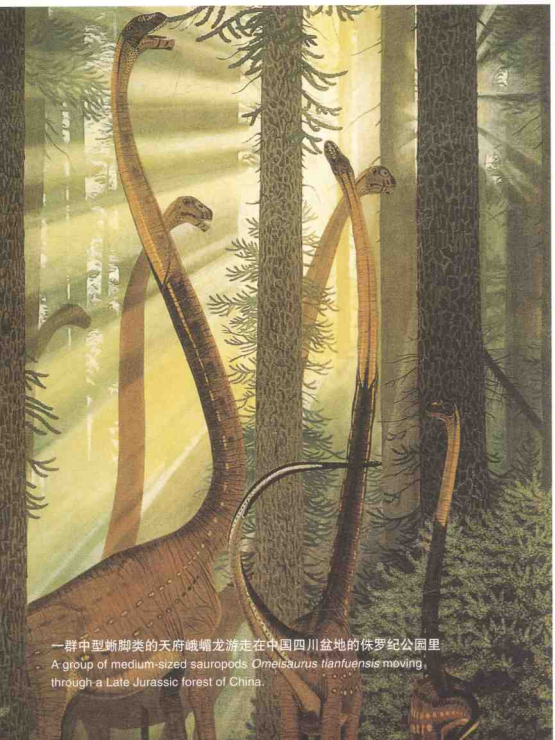
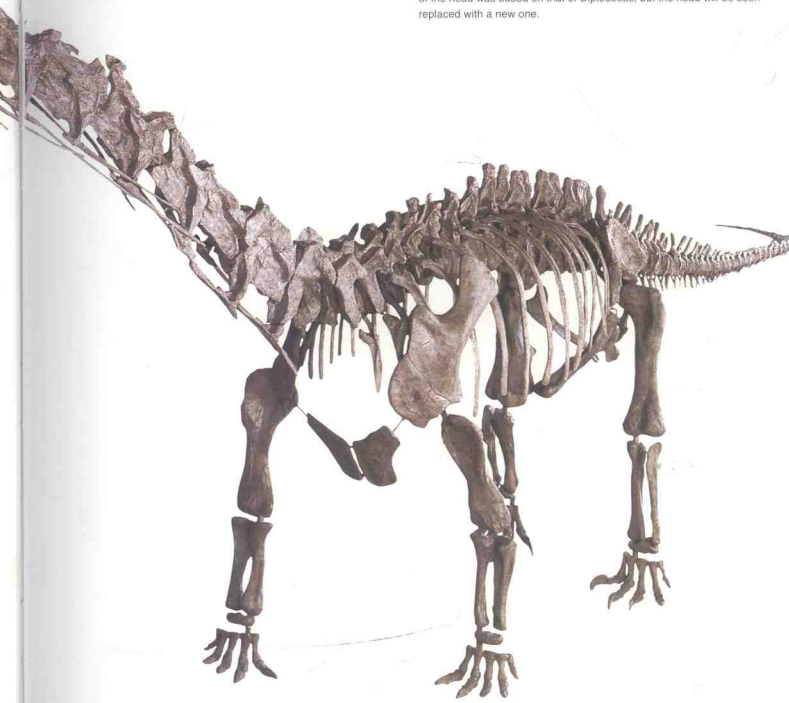


一群中型蜥脚类的天府峨嵋龙游走在中国四川盆地的侏罗纪公园里
A group of medium-sized sauropods *Omeisaurus tianfuensis* moving through a Late Jurassic forest of China.

合川马门溪龙发掘于1957年，发掘自四川省合川县。这种巨型蜥脚类长达22米，站立时肩部达4米高。颈部有19个颈椎骨，较任何其它恐龙都多，其头与颈部合起来为体长的一半。其头部是依据梁龙类复制的，它将为新近发掘较完整且正确的头骨所取代。

Skeleton of *Mamenchisaurus hochuanensis* discovered at Taihezhen, Hechuan County,Sichuan in 1957. This huge sauropod is 22m long and stands over 4m high at the shoulder. Its neck has 19 bones, more than any other known dinosaurs, while the head and neck together make up half the total length of the animal. The reconstruction of the head was based on that of *Diplodocus*, but the head will be soon replaced with a new one.



圣贤孔子鸟
Confuciusornis sanctus

绘画 曾孝源 侯宵封
Painters Zeng Xiaoyuan, Hou Xiaofeng

序言

在世界的东方，中国是一个幅员辽阔、历史悠久的国度。中国的化石，亦如中国的历史、文化一样，具有漫长的发展和研究的历程。

早在中国数千年前的原始社会，人类的生产、生活活动中已发现了这些土层中的“骨石”。2000多年前的战国时代，就有了关于“龙骨”一类化石的记载（见《山海经》）。化石在古代人类社会中普遍于宗教、哲学、科学艺术等领域。到了宋代，中国的化石终于形成了一门古老的科学——“金石学”。

中国现代的化石研究，虽只有近百年的历史，但在较短时间内便取得了长足进步。中国科学家在20世纪初发现的周口店北京人遗址，被认为是20世纪古人类学研究中最具价值的贡献，至今仍然是目前全球发现最完整、最丰富、最具有说服力的古人类活动遗存；被誉为“20世纪最惊人的发现”——澄江生物群化石，栩栩如生地展示了距今5.3亿年的“寒武纪生命大爆发”；震撼世界的辽西热河生物群中“带毛恐龙”化石的发现，使全球有关鸟类起源研究大大向前推进；发现迄今世界最早的被子植物——辽宁古果，等等。中国的化石分布地域之广，蕴藏量之丰富、门类之齐全，使中国当之无愧地成为世界著名的古生物化石大国。

辽西地区中生代脊椎动物、山东山旺生物化石群、云南澄江生物群、安徽繁昌距今200-240万年前古人类化石的发现、四川盆地、云南禄丰、内蒙古等地恐龙化石等新发现和研究成果，都成为中国及世界自然科学研究中的亮点。

辽宁西部，越来越引起世界古生物学界的瞩目。这里所发现的鸟类、哺乳类化石日益成为世界古生物学界关注的焦点。辽西地区中生代化石包括了鱼类、两栖类、爬行类、鸟类、哺乳类、无脊椎动物和植物等。其种类之繁多，化石保存之完整，堪称“世界一绝”！该地区动、植物化石研究工作在近年来迅速发展，特别是在鸟类（孔子鸟）、哺乳类（张和兽）、带毛恐龙和原始被子植物的研究上有了一系列重大发现。

早在20世纪30年代，来自山东山旺的古生物化石，展开了至今未息的山旺古生物研究历史。山旺发现保存精美的硅藻，种类繁多的孢粉，以及新近发现的真菌化石，在古生物研究中取得了重大的学术成果。山旺盆地古生物化石群因此而闻名于世，被世界古生物界美誉为生物进化史的“万卷书”。通过对古生物化石的研究，在探索气候、环境、地貌的演变等方面也取得了突出的成绩。地球上亿万年来沧海桑田的巨变，化石都提供了大量的证据，如一本完整的教科书。

近几年来，中国各个地区相继出土极有考古科研价值的化石。一系列研究成果在世界权威的自然科学杂志——美国的《科学》、英国的《自然》上发表，在全球古生物研究领域独领风骚。展望21世纪中国古生物的发现必将为全球生命起源与演变研究和世界自然科学的发展作出巨大的贡献！

深圳古生物博物馆馆长张和先生主编的这部《中国化石》，集多年来古生物化石发现和研究之大成。我对古生物学不是全都懂和有所研究，但我相信这本图册的出版是广大古生物学研究者、古生物化石爱好者所期盼已久的。特别是它的出版对于树立广大群众的科学意识具有十分重要的作用。

中国科学院院士 [signature]

2001年2月12日

Foreword

Standing in the Eastern Hemisphere of the Globe, China is widely known to the world as a country with large area and long history. As its history and culture, fossils within China have also a long story of development and research.

As early as thousands of years ago, Bone Stones were discovered from in the earth during the labor and life of human kind. Records (in Scripture of Mountains and Rivers) about fossils such like "Dragon Bone" could be found in the Age of Warring States about 2,000 years ago. Fossils were widely quoted in many aspects of ancient human society including religion, philosophy, science, art, etc. But not until Song Dynasty had research on fossils been developed into an ancient science—Metal-petrography.

Within a history of nearly one hundred years, modern research on fossils of China have made great progress. Relics of sinanthropus Pekinensis in Zhoukoudian discovered in early 20th century by Chinese scientists have been taken as the most complete, abundant, and evidencing relics of ancient human activities, and the discovery itself is known as the most valuable contribution to paleoanthropological study in this century. Chengjiang biocoenosis fossils, as "the most amazing discovery in 20th century", give the world a lively display of Expansion of Life in the Cambrian. Discovery of "Feathered Dinosaur" fossils in Jehol biocoenosis of Liaoxi has greatly accelerated the worldwide study on origin of birds. The earliest angiosperm of the world to the present is also found in China named as "Ancient Fruit of Liaoning". With its fossils in widespread locations, rich reserves, and great varieties, China is known for certain as a significant country of paleontological fossils.

More and more discoveries have been turning out as sparkles of study on natural science home and abroad including Mesozoic vertebrates in West of Liaoning Province, fossils of Shanwang biocoenosis in Shandong province, Chengjiang biocoenosis in Yunnan Province, paleoanthropus fossils of 2-2.4 millions of years ago found in Fanchang of Anhui Province, and many other discoveries and research achievements on dinosaur fossils found in Sichuan Basin, Lufeng of Yunnan Province, Inner Mongolia, etc.

At present, west of Liaoning Province is attracting more and more attention from paleontological study of the world, especially the fossils of birds and mammals found here. Mesozoic fossils discovered in this area include those of fishes, amphibious animals, reptiles, birds, mammals, invertebrates, and plants. The great variety and complete reservation of the fossils here is well known to the world! Rapid progress has been made in the study on animal and plant fossils of this area, and many significant discoveries have come out in research on birds (*Confucius sornis*), mammals (*Zhanghe therium*), feathered dinosaurs, and primary angiosperm.

Early in 1930's, the paleontological fossils from Shanwang of Shandong Province started the history of paleontological study in Shanwang till now. Well-reserved diatom, various spore powder, and newly found fungus fossils have been discovered in Shanwang, which makes up an important part of paleontological study. The paleontological fossil community in Shanwang therefore turned to be famous around the world as an "encyclopedia" for history of biological evalution. With study on paleontological fossils, a lot of exploration research can get through in climate, environment, and landform evaluation. Like a complete textbook, fossils provide sufficient evidence to the great changes taking place on this planet over billions of years.

In recent years, many fossils valued in archaeological and scientific studies have been discovered in some areas of China, and a lieu of research achievements been delivered to publishing in Science of America and Nature of Britain, authoritative magazines of the world in natural science, taking leading position in paleontological study around the world. On the turning of the 21st century, we would predict that paleontological discoveries in China will greatly contribute to the studies on origin and evaluation of life on the earth and contribute to the development of natural science of the world!

Fossils in China, edited by Mr. ZHANG He, director of the Shenzhen Paleontological Museum, is a complete collection of discoveries in and studies on paleontological fossils. Even though I am not professional or engaged in the research, I still believe that this book is published to the thirsty demand of many people engaged in paleontological study or interested in fossils and to act as an important measurement in popularization of scientific knowledge among the public.

Academician of CAS
JIA Lan-Po
(Signature)

贾兰坡

Fed.12.2001

自　序

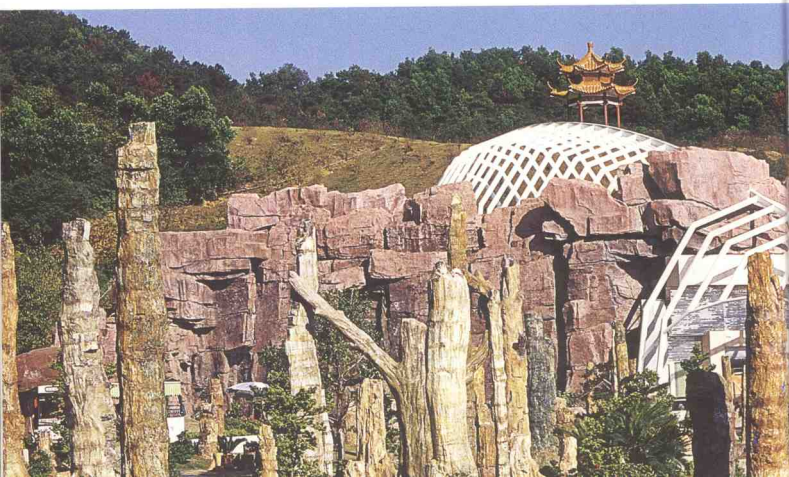
20多年以前，我脱下军装，回到辽宁锦州歌舞团工作。一次随团到辽宁义县演出，在义县大佛寺院内游玩时，偶见化石，使我与这些美丽而神奇的化石结下了一世情缘。

中国地大物博，山河壮丽。祖国的山川平野、沙漠荒滩的地下，却另有一个神秘的世界存在。化石，如岁月的残片，让你读不尽的沧海桑田，世事变幻。生命的轮廓，虽经历了亿万年的变迁，却依然明晰。3年前，我与深圳市政府合作建成了世界首座迁地化石森林和国家首座古生物博物馆。2000年我又在辽宁锦州古塔历史文化公园内新建了东北首座化石林。我将毕生精力和心血全部倾注到中国化石的采集、研究和交流当中，同时得到了很多专家和古生物学者的帮助与指教，使我在这门学科里得到了更多的收益。

近年来，我的收藏日益丰富。纵观当代有关中国化石方面的科普丛书日渐众多，心里由衷地感到高兴。我以20余年来的收藏品和资料为基础，用大量精美的图片，简洁的文字说明，把目前中国发现的各类化石编辑成这本科普读物。

热爱自然，珍爱生命。化石如一支悠长的生命进行曲，愿将此书献给所有化石爱好者和古生物研究者们，并希望通过此书能与你们沟通交流，共同进步！

2001年元月于深圳仙湖



Author' Preface

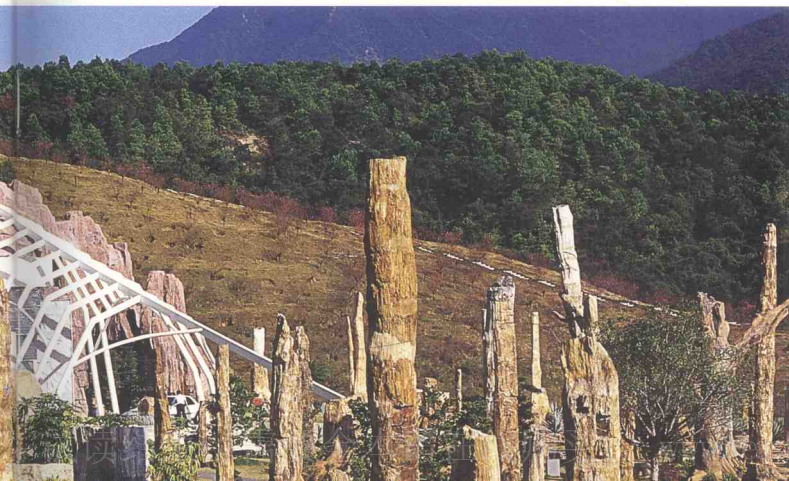
More than twenty years ago, I left army to work in Jinzhou. Once I went to give performance in Yixian with the ensemble, and was strolling around in the court of Dofosi Monastery in Yixian, I came across a fossil by accident. From then on I kept closely connected with the beautiful and magic fossils in my life.

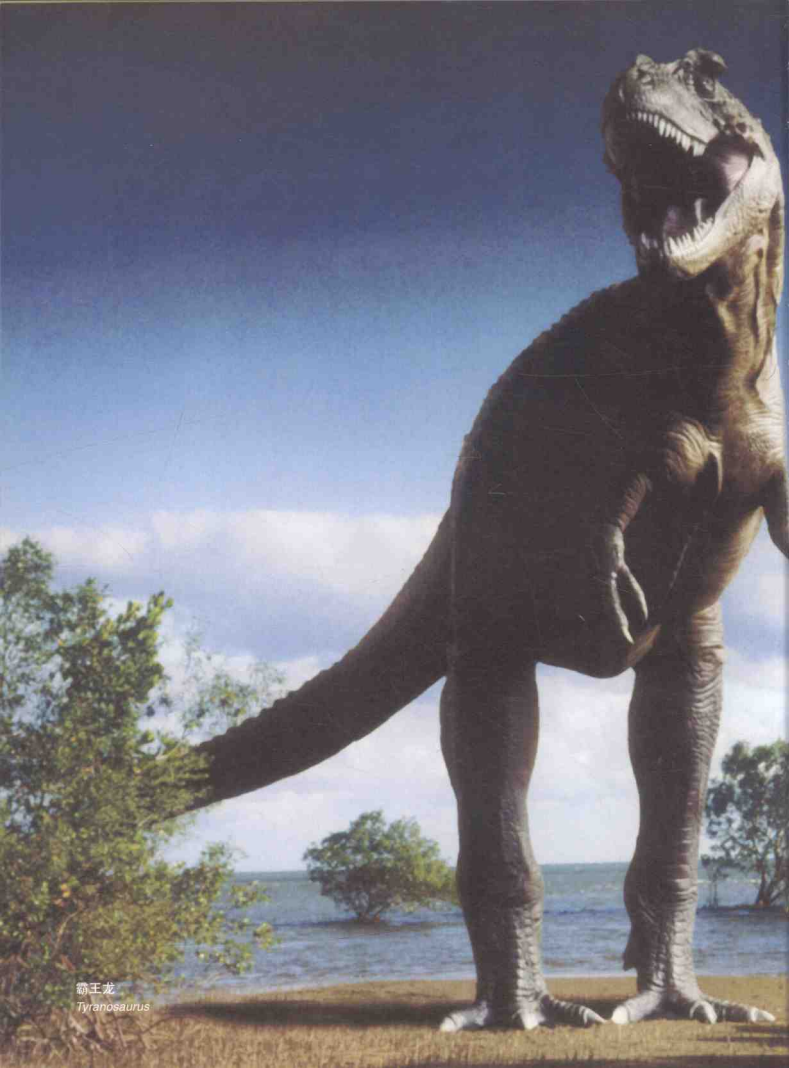
China is so wide with so many splendid mountains and rivers. Under the ground of mountains, plains, deserts and wasteland, there is a mysterious world. Fossils, just like the relics of time, show countless changes of the world. However, the information and outline of life, though after millions of years' change, are still clear to people. In the past twenty years, I collected more than ten thousands of fossils of various kinds. Three years ago, I cooperated with Shenzhen Municipal Government and prepared to set up the first moved petrified forest in the world and the first paleontological museum in China. In 2000, the first petrified forest was set up in Northeast China in Ancient Tower History and Cultural Park in Jinzhou, Liaoning. I have put all my heart in the collection, research and exchange of fossils in China. And at the same time, lots of paleobiologists gave me support and instruction, which benefited me a lot in this field.

In recent years, I collected more and more fossils. Many books for popularization of fossils in China came into being, and I am very delighted. Basing on my collection of fossils and materials in twenty years, I compiled a book about fossils in China. With numerous beautiful illustrations, the book is complete in content and concise in description. The fossils of various kinds ever found in China are covered in the popular book.

To love the nature, is to love lives. Fossils are a long evolution history of life. It is my great pleasure to present this book for all fossil fans and paleobiologists, for reading and for reference.

Zhang He
In Fair Lake, Shenzhen
January, 2001

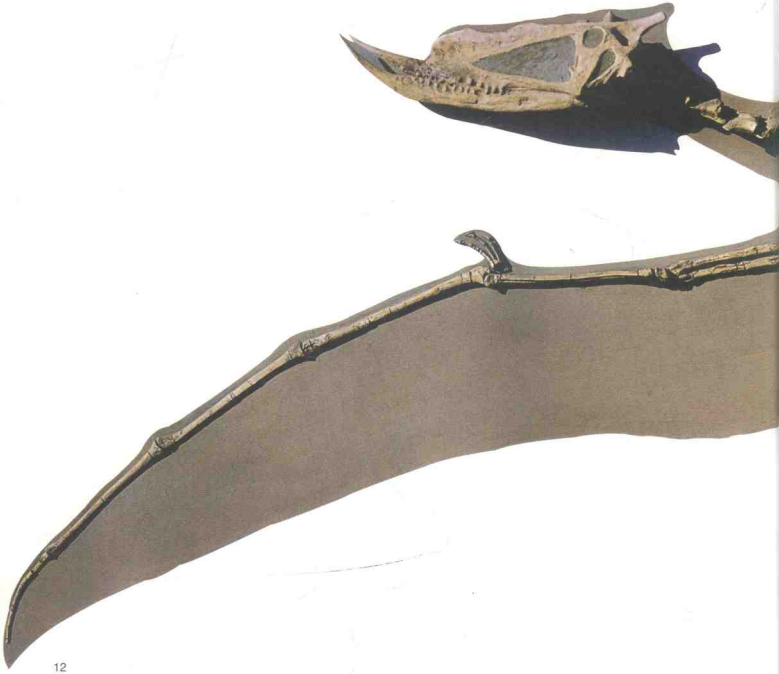




霸王龙
Tyrannosaurus

魏氏准噶尔翼龙是了解最深入的翼龙类（包括有超过30个个体被挖掘研究），它两翼展开达3.5米，在头骨中间有突起的顶脊，上下含牙齿退化稀少，前喙没有齿列。它的牙齿很像是鳄类，粗钝可能以掠食贝类为食，它们生活在大湖畔，有些古生物学者推测准噶尔翼龙也可能捕捉鱼类为食。复原的骨架是挖掘自白垩纪早期的准噶尔盆地乌尔禾江地区，两翼展开达3米，它尾部及后肢是复制的，显示准噶尔翼龙的古生态复原图。

One of the most completely known pterosaurs (including more than 30 individuals), *Dsungaripterus weii* was a large animal, with a 3.5 m wing span, possessing a midline central crest on the top of the head. The number of teeth is reduced in each jaw and the anterior anout is toothless. Their teeth are shaped like those of crocodiles, and are blunt and were probably used for crushing molluscs. They lived near large lakes. Some paleontologists suggest that they have probably been fed by snatching fish from the water surface. This mounted skeleton is from the Early Cretaceous in the Urhe region of the Junggar Basin, and has a wing span of nearly 3 m; its tail and feet have been reconstructed (A); reconstruction work(B).



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