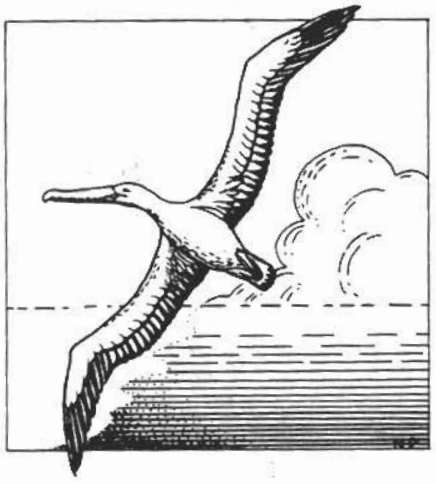
Vertebrate paleontology

Vertebrate paleontologists participated in a variety of national and international symposia in 1987. A special full-day symposium honoring Everett C. Olson (University of California, Los Angeles) was one of the highlights of the annual meeting of the Society of Vertebrate Paleontology held in October at the University of Arizona. Topics included functional morphology (vertebrates and plants), morphometrics, paleosols, evolutionary patterns and rates, community evolution (marine and terrestrial), and taphonomy. The formal presentations were followed by an evening panel discussion on 'the new paleontology.'



Dedication of the Simpson Library at the Florida State Museum (University of Florida, Gainesville), posthumously honoring George Gaylord Simpson, was a special event for vertebrate paleontologists in 1987. The nucleus of the library is formed from reprints and books derived from Simpson's personal library.

The Linnean Society Symposium on the phylogeny of tetrapods, held in March in London, reviewed the latest phylogenetic hypotheses on all major groups of amphibians, reptiles, birds and mammals. The papers were published in *The phylogeny of tetrapods* (Oxford University Press) edited by M.J. Brenton.

In May, the Evolution of Terrestrial Ecosystems program (National Museum of Natural History, Washington, D.C.) hosted a workshop to assess the status of terrestrial paleoecology (November *Geotimes*, p. 18). Tyrrell Museum of Paleontology (Drumheller, Alberta) hosted the 4th Mesozoic Terrestrial Ecosystems Symposium and the International Messel Symposium was held in April in Frankfurt, West Germany. The De Vis Symposium on Pleistocene faunas from central Australia was held in Brisbane, Australia; the International Quaternary Association met in Ottawa, Ont.

***Vertebrate** paleontology and evolution* (W.H. Freeman, 1986) by Robert L. Carroll (Redpath Museum, McGill University) provides a comprehensive analysis of vertebrate evolution and is the 'new Romer' for students of vertebrate paleontology. Significant publications on lower vertebrates in 1987 included *The biology and evolution of lungfishes* (Alan R. Liss Inc.) edited by W.E. Bemis (University of Massachusetts, Amherst) and others. About half of the 17 papers discuss fossil dipnoans with newly described taxa incorporated in reviews of lungfish morphology and relationships.

David K. Elliott's (Northern Arizona University) reassessment of *Astrapsis desiderata*, the oldest North American vertebrate, shows that it is a primitive craniate and not a heterostracan as previously thought (*Science*, v. 237, p. 190–192). B. Fritzsch (University of Bielefeld, West Germany) suggests that the basilar papillae of the coelocanth, *Latimeria*, and tetrapods are homologous (*Nature*, v. 327, p. 153–154). A new ichnogenus and ichnospecies of fossil fish nests was described by Craig S. Feibel (University of Utah) from the Plio-Pleistocene Koobi Fora Formation, northern Kenya (*Journal of paleontology*, v. 61, p. 130–134).

On the basis of a partial redescription of the Coal Measure amphibian, *Anthracosaurus*, Jennifer A. Clack (University Museum of Zoology, Cambridge, England) concluded that the 'kinetic' skull table-cheek junction of advanced embolomeres was an immobile butt joint (*Palaeontology*, v. 30, p. 15–26). Jurgen A. Boy (*Neues jahrbuch fur geologie und palaontologie, Abhandlungen*, v. 174, p. 75–104; *Mainzer geowissenschaftliche mitteilungen*, v. 16, p. 31–65) revised the branchiosaurid temnospondyl amphibians from the Permo-Carboniferous of Europe and provided a stratigraphic and paleoecologic inventory of tetrapod deposits of the Saar-Pfalz Rotliegend.

Following a detailed description of the braincase of *Limnoscelis*, a diadectomorph from Carboniferous beds in New Mexico, Michael A. Fracasso (University of Texas, Austin) suggested in *Postilla* (n. 201, p. 1–22) that diadectomorphs and *Seymouria* are primitive reptiles related most closely to pelycosaurs.

George O. Poinar Jr. and David C. Cannatella (University of California, Berkeley) described a complete leptodactylid frog from the Eocene amber mines in the Dominican Republic (*Science*, v. 237, p. 1215–1216). Eugene S. Gaffney (American Museum of Natural History) and others published a preliminary description of the Early Jurassic turtle *Kayentachelys* (*Science*, v. 237, p. 289–291). This newly described species represents a very early stage in the evolution of turtles, although it is not yet clear if *Kayentachelys* represents either the sister taxon of modern turtles or cryptodiran turtles only.

The perennially popular dinosaurs received their due in 1987. Publications spanned the entire diversity of the group. Descriptions of new material included a dinosaur sister taxon, *Staurikosaurus* documented by Donald B. Brinkman (Tyrrell Museum of Paleontology, Alberta) in *Paleontology* (v. 30, p. 493–504), a new ceratopsian (*Ugrosaurus olsoni*) described by Emily A. Cobabe (University of Wisconsin, Madison) and David E. Fastovsky (University of Wisconsin, Madison) in *Journal of paleontology* (v. 61, p. 148–154), and the earliest therapod dinosaur, *Frenguellisaurus*, recorded by F. Novas (Museo Argentino de Ciencias Naturalis, Buenos Aires) in *IV Congresso Argentino de Paleontologia y Biostratigraphica* (v. 2, p. 1–6). Martin G. Lockley (University of Colorado, Denver) gives a good overview of studies of dinosaur trackways in *Paleobiology* (v. 13, p. 246–252).

Dinosaur extinction is still a hotly debated topic. A new paper by Piet Hut (Princeton) and others (*Nature*, v. 329, p. 118–126) invokes multiple cometary impacts to explain mass extinctions that extend over intervals of millions of years and have a partly stepwise character. However, the implications of dinosaur material from the north slope of Alaska, which was recently described by Kyle L. Davies (University of Texas, Austin) in *Journal of paleontology* (v. 61, p. 198–200) and Elisabeth M. Brouwers (U.S. Geological Survey, Denver) and others (*Science*, v. 237, p. 1608–1610), challenge the hypothesis that short-term periods of darkness and temperature decrease resulting from a bolide im-

pact caused dinosaurian extinction.

B. Rothschild and Larry D. Martin (University of Kansas, Lawrence) said that the most likely explanation for the high frequency of avascular necrosis in Cretaceous mosasaurs is caisson disease or the bends (*Science*, v. 236, p. 75–77).

Of particular interest to those studying the evolution of tetrapod locomotion was a 1987 publication by David Carrier (University of Michigan) in *Paleobiology* (v. 13, p. 326–341). Carrier argued that the development of erect postures and parasagittal gaits in therapsids and archosaurs facilitated breathing while running, thus circumventing a mechanical constraint to locomotor stamina inherited from their ancestors.

The first newsletter of the Society of Avian Paleontology, affiliated with the Society for the Study of Evolution, was published in 1987. In the popular press, Storrs Olson (Smithsonian Institution) reported the discovery of the largest flying seabird from the late Oligocene Chandler Bridge Formation, South Carolina. Most of the major bones of the pseudodontorn (bony-toothed birds) were recovered and Olson said the bird had a wingspan of 5.4 m and weighed close to 45 kg. Steven D. Emslie (Point Reyes Bird Observatory, California) illustrated the applicability of paleontological data to the management of endangered species by discussing the age and diet of fossil California condors in Grand Canyon, Arizona (*Science*, v. 237, p. 768–770).

In a paper (*Nature*, v. 326, p. 871–873) on the origin of egg-laying mammals, Zophia Kielan-Jaworowska (Zaklad Paleobiologii, Warsaw, Poland) and others suggested that *Steropodon*, a Cretaceous monotreme from Australia, is a therian but they do not believe that its teeth are tribosphenic. Consequently, they feel *Steropodon* was derived from therians before the development of tribosphenic teeth, possibly during the Jurassic. Important new early Cretaceous mammals from the Kaiparowits Plateau region of Utah were described (*Nature*, v. 325, p. 520–522; *Journal of vertebrate paleontology*, v. 7, p. 14A).

Two long-awaited books on fossil mammals were published in 1987. A popular book, *Mammal evolution* (Facts on File Publications) by R.J.G. Savage (The University, Queen's Road, England) is graced by hundreds of color illustrations by M.R. Long. It is the first major popular book on mammal evolution to appear in over a decade. *Cenozoic mammals of North America: geochronology and biostratigraphy* (University of California Press, 1987), edited by Michael O. Woodburne (University of California, Riverside), started at a Geological Society of America meeting in 1973. This project has evolved over the last 15 years, and the resulting book now includes the latest information on correlation of Cenozoic terrestrial deposits by means of fossil mammals.

Most of the attention in fossil mammals was focused on deciphering the complex matter of mammal phylogeny, which has seen little work since 1910. Several papers discussing the morphological versus molecular approaches to relationships of orders of mammals appeared in *Molecules and morphology in evolution: conflict or compromise?* (Cambridge University Press) edited by Colin Patterson (British Museum of Natural History).

The detailed relationships of mammalian orders were discussed by 2 American Museum of Natural History paleontologists, Michael J. Novacek and Andre R. Wyss (*Cladistics*, v. 2, p. 257–287). Novacek and Wyss present evidence for the monophyly of Glires (rodents, elephant shrews, and rabbits), Archonta (primates, tree shrews, bats, and dermopterans), the ungulates (hoofed mammals), and a monophyletic group for all placentals except edentates and pangolins.

Mark Fischer (Tubingen, West Germany) in *Courier forschunginstitut senckenberg* (v. 84) presented striking and detailed anatomical evidence showing that hyraxes are related to perissodactyls, rather than elephants, as commonly believed. Robert M. Schoch (College of Basic Studies, Boston University) and Spencer G. Lucas (University of New Mexico) proposed a phylogeny of uintatheres (*Bulletin of the Geological Institute, University of Uppsala*, v. 11, p. 31–57). The first work since 1931 on the phylogeny of rhinoceroses also appeared in several papers (*Zoological journal of the Linnean Society*, v. 87, p. 341–366; *Journal of paleontology*, v. 61, p. 388–423; *Natural history*, v. 96, n. 8, p. 26–33).

Ken D. Rose (Johns Hopkins University) (*Science*, v. 236, p. 314–316) described nearly complete skeletal material of the archaic ungulate *Chriacus*. Its skeleton is very simliar to the living coatimundi (*Nasua*), with some adaptations for climbing. Wighart von Koenigswald (Hessiches Landesmuseum, West Germany) described in *Nature* (v. 326, p. 595–597) the first known skeleton of the enigmatic Apatemyidae. It had extremely elongated second and third fingers, like the aye aye lemur, which uses this finger for fishing out insects from holes in trees. A bizarre Chinese Paleocene pantodont, which apparently had a proboscis or trunk like a tapir, was described in the *Journal of vertebrate paleontology* (v. 7, p. 155–161).

New Oligocene desmostylians were described that further supported the idea of a monophyletic group Tethytheria, which includes desmostylians, sirenians, and proboscideans (*Smithsonian contributions to paleobiology*, v. 59). The interrelationships of the Tethytheria were also discussed.

A comprehensive analysis of *Late Quaternary mammalian biogeography and environments of the Great Plains and prairies* was published in *Illinois State Museum scientific papers* (v. 22). William C. Johnson (University of Kansas) edited *Quaternary environments of Kansas* (Kansas Geological Survey, Guidebook Series 5) which contains 5 papers on Quaternary vertebrate faunas.

Oscar Carranza-Casteñeda (Universidad Nacional Autónoma de México) and Wade E. Miller (Brigham Young University) reported the rediscovery of 4 type specimens and 3 other important Pleistocene fossils from Mexico that were previously lost to science (*Journal of vertebrate paleontology*, v. 7, p. 335–341). Christopher A. Shaw (G.C. Page Museum, Los Angeles) and H. Gregory McDonald (Cincinnati Museum of Natural History) reported (*Science*, v. 236, p. 186–188) the first record of a giant anteater (Xenarthra, Myrmecophagidae) in North America, more than 3,000 km north of the modern distribution of anteaters. The paleoenvironmental significance of a high-altitude Irvingtonian fauna is discussed by Karel L. Rogers (Adams Sate College) in the *Journal of vertebrate paleontology* (v. 7, p. 82–95).

A new model, the 'keystone herbivore' hypothesis, was proposed by Norman Owen-Smith (University of Witwatersrand, Johannesburg, South Africa) to explain Pleistocene extinctions (*Paleobiology*, v. 13, p. 351–362). Owen-Smith suggests that humans were responsible for the demise of the large megafauna (for example, proboscideans), which in turn caused significant alterations in vegetation resulting in habitat destruction and the extinction of smaller megafauna (for example, bovids and cervids).

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