GFF
Publication details, including instructions for authors and subscription information:
http://www.informaworld.com/smpp/title~content=t902829199

The Jurassic: In the forefront of science outreach

Vivi Vajda [a]; Susan Turner [b]
[a] Department of Geology, GeoBiosphere Science Centre, Lund University, Lund, Sweden [b] School of Geosciences, Monash University, Clayton, Victoria, Australia

Online Publication Date: 01 June 2009

To cite this Article Vajda, Vivi and Turner, Susan(2009)'The Jurassic: In the forefront of science outreach',GFF,131:1,1 — 3
To link to this Article: DOI: 10.1080/11035890902975325
URL: http://dx.doi.org/10.1080/11035890902975325

GFF volume 131 (2009), pp. 1–3. *Editorial*

The Jurassic: In the forefront of science outreach

VIVI VAJDA[1] and SUSAN TURNER[2] (GUEST EDITORS)

Vajda, V. & Turner, S., 2009: The Jurassic: In the forefront of science outreach. *GFF*, Vol. 131 (Pt. 1–2, June), pp. 1–3. Stockholm. ISSN 1103-5897.

[1]*Department of Geology, GeoBiosphere Science Centre, Lund University, Lund, Sweden; vivi.vajda@geol.lu.se*
[2]*School of Geosciences, Monash University, Clayton, Victoria 3800, Australia; paleodeadfish@yahoo.com*

Background

The Jurassic was an important period in the evolution of life on Planet Earth, covering a time span of about 55 million years from around 200–145 million years ago. This time span encompassed significant global events in Earth's geological history, including the diversification of the dinosaurs and coniferous floras (Fig. 1), mass extinctions, global greenhouse conditions, the early stages of Pangean breakup followed by major volcanic activity, sea-level changes and anoxic events that influenced marine and non-marine ecosystems.

Understanding the processes and potential for correlation within these last environmental systems is the principal goal of IGCP 506 Marine/Non-marine Correlation, an International Geoscience Programme research project sponsored by the International Union of Geological Sciences (IUGS) and UNESCO, and planned to run from 2005 to 2009. It was initiated by Professor Jingeng Sha at the Nanjing Institute of Geology and Palaeontology, Chinese Academy of Sciences (NIGPAS) in November 2005 when Sha Jingeng and Wang Yongdong hosted the inaugural conference (see Sha et al. 2006), inviting all those working in Jurassic rocks to participate. Project co-leaders are Professors Y.D. Wang (China), N. Morton (France), P.E. Olsen (USA), G. Pienkowski (Poland), A.G. Riccardi (Argentina) and B. Wimbledon (UK); A. Hallam (UK) is project advisor.

As well as being the final year of activities for IGCP 506, it is significant that this special issue of *GFF* devoted to the Jurassic is published in 2009, the year dedicated to honour Charles Darwin's 200th birthday and the 150th anniversary of his publication of "*The Origin of Species*" (Darwin 1859). It was Darwin's theory on evolution by natural selection that marked, what some say is, the most important paradigm shift in scientific thinking. Darwin made use of much palaeontological evidence in his arguments and, subsequently, palaeontology in particular was important for the formulating and testing of Darwin's ideas in a society whose worldview differed so greatly from our own. It was an enigmatic world that emerged from the fossil assemblages collected from the Jurassic outcrops in the early 1800s. These beds were exposed at places like Lyme Regis by avid collectors such as Mary Anning and contemporaries (e.g. Rudwick 1992; Torrens 1995; Turner & Burek 2009), now part of the World Heritage Dorset Coastline. Darwin was extremely interested in fossils and especially in the still puzzling fossil dinosaurs, ichthyosaurs, plesiosaurs and pterodactyls that were then being found with increasing success. In an earlier publication, English cleric and pioneer palaeontologist, the Reverend William Buckland (who wrote the first full account of a fossil dinosaur, the Jurassic *Megalosaurus*), dramatically announced that "these early periods of our infant world," featured "flocks of such like-creatures flying in the air, and shoals of no less monstrous Ichthyosauri and Plesiosauri swarming in the ocean, and gigantic crocodiles and tortoises crawling on the shores of the primaeval lakes and rivers" (Buckland 1823); scenes unimaginable to earlier god-fearing folk. Reconstructions of these ancient creatures and their ecosystems not only captured the attention of scientists such as Darwin but also caught the fascination of the public at large. Within the next century, the Jurassic would yield even more riches with oil, gas and coal found increasingly as exploration went beyond the European region.

The Jurassic world, however, has not ceased to fascinate the public, as shown by the success of Steven Spielberg's 1993 science-fiction thriller film "*Jurassic Park*" based on the novel of the same name by Crichton (1991). Despite the criticisms that the scientific eye might bring to bear on the storyline, this film and its sequels have without doubt served as an efficient tool for science's outreach to the general community and provided an opportunity for further knowledge transfer to people of all ages. The value of popular science should not be underestimated and the modern digital technologies enable us to promote the understanding of evolution, fossil ecosystems and plate tectonics in ways never before possible.

However, scientific studies of the Jurassic also confront many complex and serious issues, for example, related to the accumulation and identification of vast hydrocarbon deposits, the global influence of large igneous eruptions, the causes of ocean anoxia, and life and extinction in a high-CO_2 greenhouse world. Major climatic change characterised the beginning of the period, with a powerful Triassic–Jurassic boundary mass extinction event that resulted in the loss of over 76% of the living species and which can be traced in both marine and non-marine deposits. For most of the remaining Jurassic, the world enjoyed warm, tropical greenhouse conditions that produced thriving and diversifying communities on land and in the seas; there are lessons to learn from tracking the changing responses of flora and fauna that resulted.

Understanding the distribution, timing and duration of such events requires a detailed and precisely correlated stratigraphic

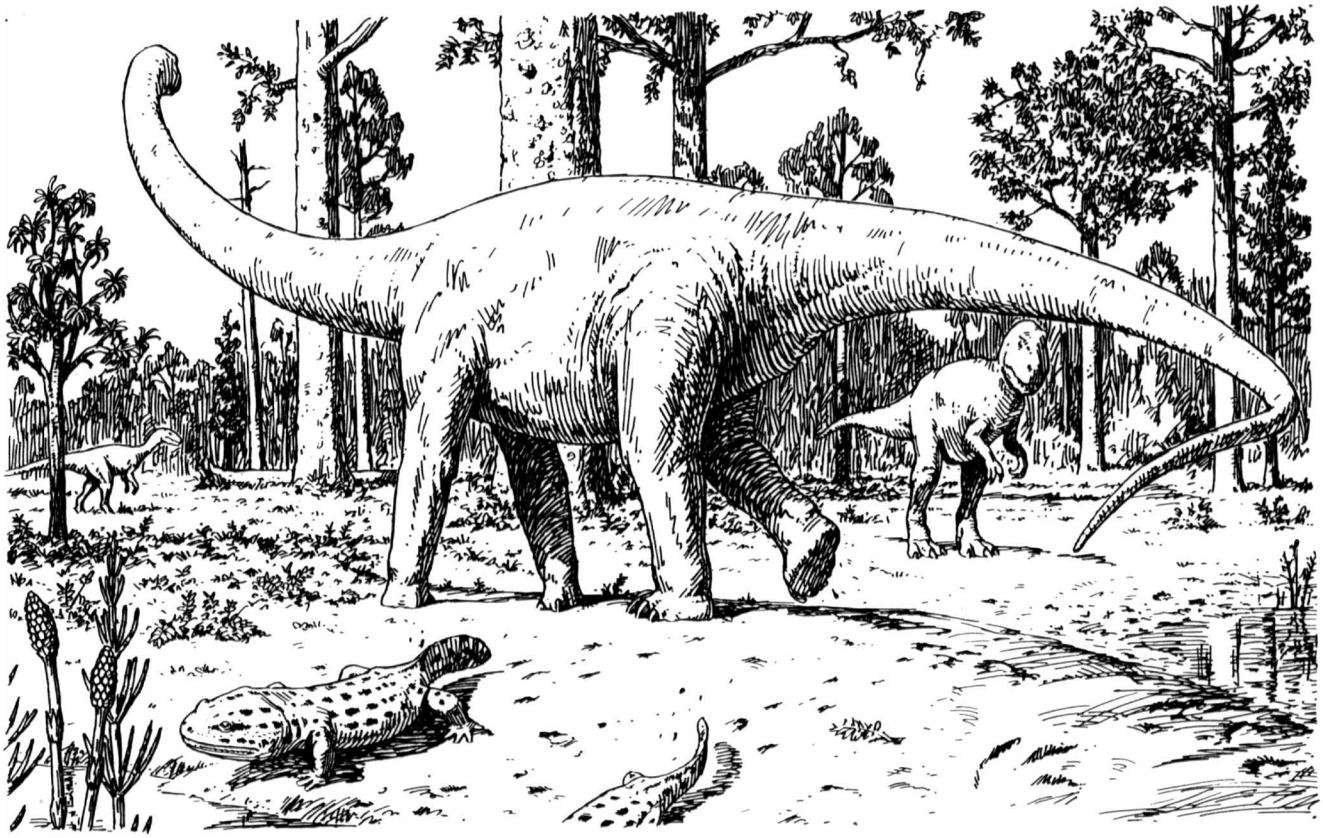

Fig. 1. Mid Jurassic terrestrial landscape with Australian flora and fauna including sauropod *Rhoetosaurus*, a theropod and amphibian Siderops sketch provided courtesy of artist Laurie Beirne, Brisbane.

framework. The immense wealth of fossils in Jurassic marine to non-marine sediments such as ammonites, dinoflagellate cysts, foraminifera, coccoliths, shark teeth, ostracodes and spores, and pollen from land plants has made high-resolution biostratigraphic zonation possible in some areas; nevertheless, data from different fossil groups commonly lack integration to provide a cohesive biostratigraphic framework. This is especially true for the correlation between the marine and terrestrial realms. Despite a vast amount of literature published on specific intervals, specific regions and particular fossil groups for the Jurassic, there remains a great need to improve correlations between marine and non-marine Jurassic successions to provide a robust global biostratigraphic synthesis for the period. This outcome would particularly benefit the search for natural commodities at a time of diminishing Earth resources and help resolve the timing and patterns of biotic turnovers. This then is the work of the current research project.

IGCP 506 held its sixth international symposium during the 33rd International Geological Congress (IGC 33) in Oslo, Norway, on 9 August 2008 with the theme of Marine and Non-marine Jurassic: Biodiversity and Climate. Some 30 scientists from 15 countries contributed 14 talks, and posters on the topic, focusing on marine invertebrate groups, terrestrial fauna and flora, geochemistry and sedimentology; a fieldtrip followed to visit Jurassic outcrops in southern Sweden and the island of Bornholm, Denmark (Vajda 2008). Meetings such as the one held at IGC33, provide a platform for scientists to add to and refine the knowledge towards marine–non-marine correlation, especially as information from new regions are added to the mix. Evaluation and correlation of the changes between the end Triassic to start of the Cretaceous requires precise and high-resolution biochronology and stratigraphy, and much new data to this end is presented in this special volume. The Oslo symposium volume, particularly, brings to light new Jurassic data on geology, faunas and floras from a wide geographical area including the southern hemisphere (Argentina, Australia and New Zealand), far eastern Russia and southeast Asia and north Africa. New ideas on palaeoclimate and palaeogeography are offered as well as regional correlations (e.g. for Australia, New Zealand, parts of China, Scandinavia, Spain and Tunisia).

This special publication, additionally, is part of a project within LUCCI, a newly established research centre at Lund University devoted to studies of the carbon cycle and how it interacts with the climate system. The centre is funded by the Swedish Research Council through "The Linnaeus" grant, which will provide a firm foundation for the centre during the coming 10 years.

Further information regarding IGCP 506 can be obtained by contacting Professor Sha Jingeng (www.nigpas.cn); for more on this, and other UNESCO:IUGS IGCP projects in general visit web site: http://www.unesco.org. We are pleased also to dedicate this volume to the UN International Year of Planet Earth (IYPE), another initiative of UNESCO and the IUGS.

Acknowledgements. — First, we would like to thank all the contributors and the referees for their excellent contributions making this special issue possible. We also gratefully acknowledge Joakim Mansfeld (Editor in chief of GFF) for invaluable advices and help with final editorial issues, and the Board of the Geological Society of Sweden for supporting the publication of this issue. We would like to thank the financial support for the meeting and following field excursion and the associated publications by; UNESCO-IUGS IGCP, the Swedish Research Council (Grant No. 80612901), the IGC 33 Geohost stipend for supporting several keynote speakers and other participants, the Royal Swedish Academy of Sciences and Knut and Alice Wallenberg Foundation grant (VV) and support from the Australian IGCP Committee (ST). We further want to acknowledge Lund University and the GeoBiosphere Science Centre.

References

Buckland, W., 1823: *Reliquiae Diluvianae; or, observations on the Organic Remains Contained in Caves, Fissures, and Diluvial Gravel, and on other Geological Phenomena, Attesting the Action of an universal deluge*. John Murray. 303 pp. [Arno reprint 1978].

Crichton, M., 1991: *Jurassic Park*. Centure. 431 pp.

Darwin, C.R., 1859: *Origin of species by means of natural selection*. John Murray. 477 pp.

Rudwick, M.J.S., 1992: *Scenes from deep time. Early pictorial representations of the Prehistoric World*. The University of Chicago Press. 280 pp.

Sha, J.-G., Wang, Y.-D. & Turner, S. (eds.), 2006: *Marine-nonmarine Jurassic: Boundary events and correlation*. Proceedings of the International Symposium on the Jurassic Boundary Events and the First Annual Symposium of the International Geoscience Program IGCP 506: November 1–4 2005, Nanjing, China, *Progress in Natural Science 16*, 1–566.

Torrens, H., 1995: Mary Anning (1799–1847) of Lyme, "the greatest fossilist the world ever knew". *British Journal for the History of Science 28*, 257–284.

Turner, S. & Burek, C., 2009: Forgotten women in an extinct Saurian (Man's) World. *In* R. Moody, E. Buffetaut, D. Martill & D. Naish (eds.): Dinosaurs: A historical perspective. *Geological Society, London Special Publication* (in press).

Vajda, V., 2008: Jurassic – Climate and biodiversity. *Episodes 31*, 436–437.