REPORT

British Triassic palaeontology: literature supplement 42

Since the completion of the previous supplement on British Triassic palaeontology (*Mercian Geologist*, **19**, 285) the following works on or relating to the subject have appeared or come to the compiler's notice.

Atkinson, J. W. & Wignall, P. B. 2019. How quick was marine recovery after the end-Triassic mass extinction and what role did anoxia play? *Palaeogeography, Palaeoclimatology, Palaeoecology*, **528**, 99–119.

Atkinson, J. W. & Wignall, P. B. 2020. Body size trends and recovery amongst bivalves following the end-Triassic mass extinction. *Palaeogeography, Palaeoclimatology, Palaeoecology,* **538**: 109453, https://doi.org/10.1016/j.palaeo.2019.109453. 18 pp.

Atkinson, J. W., Wignall, P. B., Morton, J. D. & Aze, T. 2019. Body size changes in bivalves of the family Limidae in the aftermath of the end-Triassic mass extinction: the Brobdingnag effect. *Palaeontology*, **62**, 561–582.

Ballell, A., Moon, B. C., Porro, L. B., Benton, M. J. & Rayfield, E. J. 2019. Convergence and functional evolution of longirostry in crocodylomorphs. *Palaeontology*, **62**, 867–887.

Bennett, S. C. 2020. Reassessment of the Triassic archosauriform *Scleromochlus taylori*: neither runner nor biped, but hopper. *PeerJ*, **8**: e8418, DOI 10.7717/peerj.8418. 77 pp.

Bestwick, J., Unwin, D. M., Butler, R. J., Henderson, D. M. & Purnell, M. A. 2018. Pterosaur dietary hypotheses: a review of ideas and approaches. *Biological Reviews*, **93**, 2021–2048.

Cashmore, D. D. & Butler, R. J. 2019. Skeletal completeness of the non-avian theropod dinosaur fossil record. *Palaeontology*, **62**, 951–981.

Chure, D. J. & Engelmann, G. F. 2016. Fossil vertebrates in drill cores: a rare but surprisingly diverse record. *New Mexico Museum of Natural History & Science Bulletin*, **74**, 51–59.

Cubo, J. & Jalil, N.-E. 2019. Bone histology of *Azendohsaurus laaroussii*: implications for the evolution of thermometabolism in Archosauromorpha. *Paleobiology*, **45**, 317–330.

Dróżdż, D., 2018. Osteology of a forelimb of an aetosaur *Stagonolepis olenkae* (Archosauria: Pseudosuchia: Aetosauria) from the Krasiejów locality in Poland and its probable adaptations for a scratch-digging behavior. *PeerJ*, **6**: e5595, DOI 10.7717/peerj.5595. 28 pp.

Duffin, C. J. 2019. Charles Moore and the Late Triassic vertebrates: history and reassessment. *Geological Curator*, **11**, 143–160.

Fensome, R. A., Williams. G. L. & MacRae, R. A. 2019. The Lentin and Williams Index of Fossil Dinoflagellates 2019 Edition. *AASP Contributions Series*, **50**, 1173 pp.

Hoffman, D. K., Heckert, A. B. & Zanno, L. E. 2018. Under the armor: X-ray computed tomographic reconstruction of the internal skeleton of *Coahomasuchus chathamensis* (Archosauria: Aetosauria) from the Upper Triassic of North Carolina, USA, and a phylogenetic analysis of Aetosauria. *PeerJ*, **6**: e4368, DOI 10.7717/peerj.4368. 22 pp.

Hudgins, M. N., Uhen, M. D. & Hinnov, L. A. 2020. The evolution of respiratory systems in Theropoda and Paracrocodylomorpha, the end-Triassic extinction, and the role of Late Triassic atmospheric O_2 and CO_2. *Palaeogeography, Palaeoclimatology, Palaeoecology*, **545**: 109638, https://doi.org/10.1016/j.palaeo.2020.109638. 15 pp.

Jäger, K. R. K., Gill, P. G., Corfe, I. & Martin, T. 2019. Occlusion and dental function of *Morganucodon* and *Megazostrodon*. *Journal of Vertebrate Paleontology*, **39**, DOI: 10.1080/02724634.2019.1635135. 21 pp.

Jin Meng, Fangyuan Mao, Gang Han, Xiao-Ting Zheng, Xiao-Li Wang & Yuanqing Wang 2020. A comparative study on auditory and hyoid bones of Jurassic euharamiyidans and contrasting evidence for mammalian middle ear evolution. *Journal of Anatomy*, **236**, 50–71.

Kalthoff, D. C., Schulz-Kornas, E., Corfe, I., Martin, T., McLoughlin, S. & Schultz, J. A. 2019. Complementary approaches to tooth wear analysis in Tritylodontidae (Synapsida, Mammaliamorpha) reveal a generalist diet. *PLOS ONE* **14**: e0220188,https://doi.org/10.1371/journal.pone.0220188. 24 pp.

Keeble, E. & Benton, M. J. 2020. Three-dimensional tomographic study of dermal armour from the tail of the Triassic aetosaur *Stagonolepis robertsoni*. *Scottish Journal of Geology*, **56**, 55–62.

King, B. & Beck, R. M. D. 2020. Tip dating supports novel resolutions of controversial relationships among early mammals. *Proceedings of the Royal Society of London*, **B 287**: 20200943, http://dx.doi.org/10.1098/rspb.2020.0943. 7 pp.

Langer, M. C., da Rosa, Á. A. S. & Montefeltro, F. C. 2017. *Supradapedon* revisited: geological explorations in the Triassic of southern Tanzania. *PeerJ*, **5**: e4038, DOI 10.7717/peerj.4038. 27 pp.

Lovegrove, J. 2019. Investigating the palaeotopography and variations in ecology of Rhaetian Bristol using the Westbury Formation bone bed. *Palaeontological Association N/L*, **102**, 85–88.

Mussini, G., Whiteside, D. I., Hildebrandt, C. & Benton., M. J. 2020. Anatomy of a Late Triassic Bristol fissure: Tytherington fissure 2. *Proceedings of the Geologists' Association*, **131**, 73–93.

Parker, W. G. 2018. Redescription of *Calyptosuchus* (*Stagonolepis*) *wellesi* (Archosauria Pseudosuchia: Aetosauria) from the Late Triassic of the southwestern United States with a discussion of genera in vertebrate paleontology. *PeerJ*, **6**: e4291, DOI 10.7717/peerj.4291. 47 pp.

Parker, W. G. 2018. Anatomical notes and discussion of the first described aetosaur *Stagonolepis robertsoni* (Archosauria: Suchia) from the Upper Triassic of Europe and the use of plesiomorphies in aetosaur biochronology. *PeerJ*, **6**: e5455, DOI 10.7717/peerj.5455. 31 pp.

Patrick, E. L., Whiteside, D. I. & Benton, M. J. 2019. A new crurotarsan archosaur from the Late Triassic of South Wales. *Journal of Vertebrate Paleontology*, **39**, DOI: 10.1080/02724634.2019.1645147. 18 pp.

Radley, J. D. & Coram, R. A. 2020. The earliest Laurasian unionoids? Freshwater bivalves from the Middle Triassic of Devon, southern UK. *Proceedings of the Geologists' Association*, **131**, 60–66.

Riding, J. B. 2020. Literature compilations in palynology are not simply tedious lists. *Palynology*, **44**, 1–3.

Riding, J. B., Scott, A. C. & Collinson, M. R. 2020. A biography and obituary of William G. Chaloner FRS (1928–2016). *Palynology*, **44**, 127–166.
Scheyer, T. M., Spiekman, S. N. F., Sues, H.-D., Ezcurra, M. D., Butler, R. J. & Jones, M. E. H. 2020. *Colobops*: a juvenile rhynchocephalian reptile (Lepidosauromorpha), not a diminutive archosauromorph with an unusually strong bite. *Royal Society Open Science*, **7**: 192179, http://dx.doi.org/10.1098/rsos.192179. 14 pp.
Simões, T. R., Vernygora, O., Caldwell, M. W. & Pierce, S. E. 2020. Megaevolutionary dynamics and the timing of evolutionary innovation in reptiles. *Nature Communications*, **11**: 3322, https://doi.org/10.1038/s41467-020-17190-9. 14 pp.
Sobral, G. & Müller, J. 2019. The braincase of *Mesosuchus browni* (Reptilia: Archosauromorpha) with information on the inner ear and description of a pneumatic sinus. *PeerJ*, **7**: e6798, DOI 10.7717/peej.6798. 28 pp.
Tihelka, E. 2019. New Mesozoic earwigs from England, with a catalogue of fossil Dermaptera. *Proceedings of the Geologists' Association*, **130**, 609–611.
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THE RECORD

Report of the Secretary

Our individual membership now stands at 138 together with 51 joint members, 0 student members and 25 institutional members. Five new members joined during the year. We regret to record the death of Dorothy Morrow, a member from the early days of the Society; former Secretary for many years and then President, she continued as a member, and up to the remarkable age of 101 maintained a keen interest in the Society.

Indoor Meetings

Once again Ian Sutton is to be thanked for organising the spring 2019 and autumn/winter 2019–20 lecture programmes which covered a varied range of topics, as detailed below. These were held on Saturday evenings at the lecture theatre in the Sir Clive Granger Building at Nottingham University's main campus. The Society is indebted to the School of Geography at the University for sponsoring our lectures and for the use of their excellent facilities. Peter Beastall applied his technological know-how in overseeing the operation of the audio-visual equipment.

Following the 2019 AGM on 9 March, Dean R. Lomax, Visiting Scientist at Manchester University, delivered a superbly illustrated lecture on **Incredible Ichthyosaurs – a decade studying Jurassic 'Sea Dragons'**. More than 100 species of ichthyosaur have been found across the globe, with thousands of specimens from the UK. Most British specimens are from the Jurassic Coast, Dorset, and from quarries in Somerset, and by far the most common British ichthyosaur genus is *Ichthyosaurus*. Over the past decade Palaeontologist Dean Lomax has dedicated much of his academic career to studying ichthyosaurs by examining specimens held in museums across the world. This has resulted in the discovery of a new species (*Ichthyosaurus anningae*, named in honour of Mary Anning), some incredibly rare specimens, and other finds that are new to science, including a newly-identified giant ichthyosaur from the Westbury Mudstone Formation (latest Triassic) of Lilstock, Somerset.

The subject of the April lecture, **Derbyshire Blue John revisited** was chosen to coincide with the publication by the Society of a new, up-dated and improved edition of the definitive book on Derbyshire Blue John, written 20 years ago by Trevor Ford (reviewed in the 2019 issue of *Mercian Geologist*). Blue John fluorite is one of the few minerals that can be claimed as unique to Britain. The banded purple and yellow colouring of the material extracted from Treak Cliff at Castleton cannot be matched by fluorite that is known from anywhere else in the world. The reason for its rarity lies in the unusual geology of the reef limestone of Treak Cliff. When cut and worked into ornaments or jewellery, Blue John is beautiful. Tony Waltham gave an overview of Blue John, its mining and its uses as a decorative stone, highlighting some of the changes in our understanding of the geology and history of Blue John. Noel Worley then described the geological features at Treak Cliff, which is probably the most accessible example of mineralized hypogenic karst in the South Pennine Orefield, and explained how the geological conditions influenced the formation of the distinctive colour banding of Blue John fluorite.

Sea floor minerals exploration was the focus of **Into the abyss: exploring the mineral potential of Earth's final frontier**, a lecture given in October by Paul Lusty, Principal Economic Geologist at the British Geological Survey. Growing demand for mineral raw materials, coupled with the increasing challenges of land-based mining and geopolitics, will motivate the search for alternative sources of mineral supply, pushing resource development into frontier environments. A resource frontier currently attracting significant attention is the ocean floor, which covers more than two-thirds of the planet's surface and hosts a diverse spectrum of geological environments, geomorphological features and ecosystems. Metal resources on the seafloor have been known for more than a century and it is speculated that the seafloor may contain a metal endowment proportionate to its area.

Extensive areas of ocean floor are now licensed for exploration and some deep-ocean mining projects are scheduled to commence operation in the next few years. As a consequence, deep-ocean mining has moved from a distant possibility to a reality that could make an important contribution to metal supply and economic growth. Despite this optimism, there is a requirement for enhanced mineral exploration models, improved resource assessment, more robust economic evaluation, and the development of cost-effective exploration strategies and techniques. This presentation explored these issues in the context of two case studies. The first considered the Trans-Atlantic Geotraverse hydrothermal field, located at the Mid-Atlantic Ridge, which is known for its seafloor massive sulfide deposits. The second case study examined the mineral resource potential of ferromanganese crusts, which develop on seamounts in the deep-ocean. These deposits can be highly enriched in 'critical' metals required for high-technology and green energy applications.