

Chapter 2, 'Ichnology', moves us on from regional geology to the study of trace fossils. The most interesting discussion is the author's dismissal of the utility of ichnotaxonomic names for dinosaur tracks (p. 26). This is supported by discussion of footprint preservation and substrate cohesiveness at the time of track formation. I dislike of the common use throughout of 'sediments' when the author means 'sedimentary rocks'. Noticeably, some of the English lacks polish and Pérez-Lorente should have been better served by his copy editors. For example, '... the rocks include uncommon carbonates and more abundant sandstone, mudstone and shale' (p. 17) should have been more transparently stated as '... the rock sequence is comprised of sandstone, mudstone and shale with rarer limestones'. And consider p. 28: '... Sarjeant, *et al.* (2002) ... used the term *semiplantigrade* rather than *plantigrade* to characterize such tracks, although William Antony S. Sarjeant (pers. comm.) notes, "Personally I think semiplantigrade is preferable."' Apart from the peculiar structure and repetition, who was Sarjeant (1935–2002) making a personal communication to? And it surely is not normal practice to include a pers. comm. from an authority that has been dead for 13 years?

Chapter 3, 'The Tracksites', is the main document of this book. Almost 280 pages long, with 217 figures and 20 tables, it is a fieldguide to the tracksites of La Rioja. Detail is the key and each site is considered in great detail with locality maps, tracksite diagrams, photographs of tracks and trackways, and discussions of palaeoecology and preservation. I applaud Pérez-Lorente for his uncompromising approach. He is at pains to present each site wrinkles and all, explaining how problems of indifferent exposure, access, weathering, erosion and human exploitation (such as building a road through a site; see p. 94) have caused deterioration of localities. The effects of synsedimentary deformation are explained in particular detail. I trust that this part of the analysis will inform and influence other studies of trackways.

There are some rare troubles with diagrams. The caption to fig. 3.139 appears to be missing a word(s); the drawing in fig. 3.152 (B) cannot be matched with the poorly reproduced photograph; and fig. 3.169 is a graph with some inaccuracy in the scales.

Short, later chapters are concerned with tracksite conservation and a summary. Both the reference list and index appear to be adequate. One peculiarity of this title is the 'blurb' on the dust jacket. This is written by James O. Farlow ... who is also editor of this series of books. Surely this is not quite the done thing?

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OBSERVATIONS ON THE STRUCTURE OF FOSSIL PLANTS FOUND IN THE CARBONIFEROUS STRATA by Edward William Binney. Cambridge University Press, Cambridge, 2015 [first published by the Palaeontographical Society 1868–1875]. No. of pages: 232. Price: £ 19.99 (paperback). ISBN 978-1-108-08435-2 (paperback).

Edward William Binney (1812–1881) was a leading authority on the geology and fossil plants of the Lancashire and Cheshire coalfields. His work contributed to the early development of our understanding of the most prominent plants of the coal measure floras, in particular

the habit of the trees, the relationships among organ systems and their internal anatomical structure. This monograph, published in four parts between 1868 and 1875, is Binney's best-known work. It focuses on the internal anatomical organization of roots, stems and cones of horsetails and lycopods, revealing remarkable detail of the cellular structure of the tissue systems preserved in carbonate concretions. The monograph is based on Binney's own collection, much of which is now housed in the Sedgwick Museum of Earth Sciences, Cambridge.

Apart from a short introduction paragraph, in which Binney explained the need to describe his own collection of specimens and slides made from peels of Carboniferous plants, the book can be divided into four parts. All of them are illustrated beautifully by drawings; the original plates have been very well reproduced. Each part starts with an overview of the literature on the genera discussed in the volume, known at that time.

The first part deals with the sphenophyte genera *Calamites* and *Calamodendron*. The latter genus is used by Binney for those specimens of *Calamites* that show internal structure. He also discussed the leaf genus *Asterophyllites* and its fructification. Each specimen of his own collection is described, illustrated in detail and discussed.

Other parts mainly deal with genera from the lycophyte order Lepidodendrales. The second part describes *Lepidostrobus* and some allied cones, including remarks on micro- and macrospores. Binney first gave a brief overview of the relationships in the Lepidodendrales (including the genera *Lepidodendron* and *Sigillaria*), discussing stems, branches, leaves, roots and fructifications. In the descriptive part, Binney made a number of new species, e.g., *Lepidostrobus russellianus*, *L. dubius*, *L. tenuis*, *L. hibbertianus*, *L. wuenschianus* and *L. latus*, some of which are still in use. Moreover, he created the new genus *Bowmanites* with its type species *B. cambrensis*. The latter, however, is not a lycophyte, but a sphenophyte strobilus. Binney recognized this already, illustrating an obviously sphenophyte stem with whorls of leaves and an attached strobilus, remarking that the strobilus resembled those in the genus *Calamostachys* Schimper. But because the macrospores were so different from those of *Calamostachys*, he decided to establish the genus *Bowmanites* for it, named after its collector Mr. Bowman. The latter had even made a restoration of the plant, which was published by Binney. We now know that *Bowmanites* is indeed an sphenophyte strobilus, belonging to the order of the Sphenophyllales.

The third part deals mainly with *Lepidodendron*, but a specimen of *Sigillaria* is described as well, plus a number of specimens of *Halonia*, a genus for stems with spirally arranged tubercles intermingled with small leaves belonging to the Lepidodendrales, but of which even to date not all details are known. The fourth and final part discusses and figures specimens of *Sigillaria*, especially *S. vascularis* Binney, and *Stigmaria* (a genus for the root systems of both *Sigillaria* and *Lepidodendron*).

This monograph is a good example of the excellent palaeobotanical research already carried out by 19th century scientists on the limited material that was available to them at the time. A book worthwhile reading!

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