



Tracking Spanish dinosaurs.

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BOOK REVIEW

Dinosaur Footprints & Trackways of La Rioja

Félix Pérez-Lorente (2015)

Indiana University Press (363 pp.)

Tracking Spanish dinosaurs

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Spain is renowned for the exceptional richness of its Early Cretaceous fossil record. Iconic examples such as the Galve area (Teruel Province) and the site of Las Hoyas (Cuenca Province) are famous worldwide because they document the rich diversity and complex biogeographic history of dinosaurs and other vertebrates. Spain can also claim to host one of the world's most spectacular concentrations of dinosaur tracks and trackways, in the hilly and shrubby landscape of La Rioja. This region, covering part of the Burgos, Soria and La Rioja provinces, has yielded more than 9150 dinosaur footprints since the late 1960s. But this Spanish megatracksite still contains many hidden treasures. New dinosaur tracks and trackways are being discovered every year, alongside body fossils and other traces of various groups of plants, invertebrates and vertebrates. After nearly fifty years of study and the

publication of hundreds of scientific papers, there was a crucial need for a comprehensive update about this major landmark in dinosaur ichnology. Félix Pérez-Lorente took up the challenge. This well-known ichnologist delivers a magnificent book on the diverse footprints from La Rioja to which he has dedicated much of his career. Five chapters of unequal length provide a detailed description of this remarkable palaeontological heritage. The first two chapters present the geology of the Cameros Basin, the distribution of the tracksites, as well as the main terms and criteria used for characterizing dinosaur tracks and trackways. Some illustration of the measurements presented throughout the book would have helped readers unfamiliar with standard ichnological techniques. The third chapter represents 75% of the book. It describes in detail about 30 selected tracksites, following the same basic structure: history, location, important stratigraphic and faciological features (oddly presented under the heading “lithology”), ichnotype description and relation with the substrate. The much shorter fourth chapter is devoted to the legal and physical protection of the track-bearing surfaces and outcrops. Félix Pérez-Lorente ends the book with a synthesis of the occurrence and abundance of dinosaur footprints in La Rioja, together with a brief discussion of some remarkable ichnological features, such as interdigital webs and semiplantigrade footprints. A rich bibliography and an index complement this outstanding contribution. However, readers searching for a specific piece of information might sometimes be confused, due to the occasional mismatch between a heading and its actual content.

The book is truly remarkable for the amount of original material it contains. New or updated measurements and descriptive statistics are given for many sites, thus offering explicit evidence for the interpretations put forward by the author. Félix Pérez-Lorente provides, with a great deal of humility, a critical overview of ichnological practices and interpretations, sometimes by discussing simple but fundamental issues, such as how to draw the outline of a track and how to measure it. The absence of over-interpretation and of “argument from

authority” is really enjoyable. The author sticks to a field-based, pragmatic approach. His convincing interpretations are supported by explicit lines of evidence and are therefore left open to scientific debate in a constructive way. The fact that the author and his research group are “sceptical” about the usefulness of ichnotaxonomic names is emblematic of this philosophy. The book thus contains the description of ichnotypes conservatively assigned to large dinosaur groups such as theropods, sauropods or ornithopods. This avoids an inextricable jungle of ichnotaxonomic names and allows readers to forge their own opinions based on the available evidence from La Rioja. Abundant, high-quality iconography complements the text throughout the book, including many black-and-white photographs, as well as numerous neat interpretative drawings illustrating the various steps of taphonomic, behavioural and biomechanical track-forming processes. These drawings have great pedagogical virtues and are based on the careful consideration of the studied surface relative to the walking surface. The book therefore takes full advantage of the immense diversity of ichnites and foot/substrate interactions documented in the Spanish ichnological bonanza.

Pérez-Lorente’s book is also outstanding because it provides valuable insights into conservation issues. The description of the legal and technical measures taken for various tracksites does not gloss over the frequent logistical or human problems associated with this kind of endeavour. Such issues also remind us that protection in La Rioja is not just a matter of fossil tracks but also extends to culture, education and environment. These inputs are particularly useful at a time when many geological sites around the world are in search of protection or are being integrated into in land-use planning and Geoparks. The educational use of the Spanish megatracksite is not described in detail, but the fact that 125 students participate in intensive courses, conferences and field camps each year is reassuring. In the same way, the presentation throughout the book of local popular beliefs about the tracks and

72 their makers is refreshing. Popular wisdom is proven, since some tracks from La Rioja were
73 thought to have been made by giant chickens, which is actually quite close to the truth!

74 Overall, Félix Pérez-Lorente has to be congratulated for sharing his career-long experience in
75 a book that will be the reference for La Rioja and that will undoubtedly serve for the study of
76 tracksites around the world. It is a worthy read for anyone interested in - or fascinated by -
77 these exceptional ichnological wonders and the animals that made them.

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79 Figure caption:

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81 Large theropod footprints along Trackway PP146 from Peñaportillo (Lower Cretaceous,
82 Enciso Group), La Rioja, Spain. Photograph courtesy of Georges Gand.

