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Review paper

The historiography of dinosaur footprints of the Lower Cretaceous Wealden Group on the Isle of Wight, UK

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ABSTRACT

The Isle of Wight, UK, often called 'Dinosaur Island', preserves one of Europe's most extensive Early Cretaceous dinosaur records. From pioneering 19th century discoveries to modern photogrammetry and 3D modelling, ichnological research has enhanced the understanding, and provided key evidence of the composition and paleoecology of the Wealden Group dinosaur assemblage. The accessibility and year-round visibility of many track sites has promoted geotourism, highlighting their dual scientific and educational significance. This paper provides the first comprehensive review of Isle of Wight dinosaur ichnology, synthesising dispersed literature and providing a foundation for future research.

Contents

1. Introduction

The Isle of Wight, which lies off the south coast of England, is often referred to as "Dinosaur Island," and holds one of Europe's most extensive records of dinosaur fossils (Martill and Naish, 2001; Batten, 2011). The Lower Cretaceous geology of the island has been studied since the early 19th century, with the first discovery of possible dinosaur remains reported by James Hay, in the Hampshire Telegraph and Sussex Chronicle in 1818 (Torrens, 2014). These remains, initially interpreted as the '*bones of that stupendous animal*' supposed to be "*the Mammoth: or Mastodon, several of the vertebrae, or joints of the backbone, measure 36 inches in circumference, [were] recently discovered in the parish of Motteston*" [Mottistone] on the south side of the Isle of Wight. The bones have since been lost, so it remains uncertain whether these were mammals from the Pleistocene gravels or dinosaur bones derived from the underlying Wessex Formation. Subsequent discoveries in the 19th century focused on vertebrate remains collected from rapidly eroding cliffs and foreshore, with notable contributions from Buckland (1829, 1835, 1836), Hulke (1870, 1871, 1873, 1874, 1879, 1881, 1882), Mantell (1846, 1854), Owen (1842, 1853, 1858) and Seeley (1875, 1882, 1887). Owen (1842), notably, used an *Iguanodon* sacrum collected at Brook Bay as a basis for his now famous group Dinosauria.

Intensive study within the last three decades has revealed over 20 new dinosaur species unique to the island (Hutt et al., 1996, 2001; Martill and Naish, 2001; Naish et al., 2004; Benson et al., 2009; Mannion et al., 2011; Barker et al., 2021, 2022; Naish and Cau, 2022;

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Lockwood et al., 2021, 2024, 2025; Pond et al., 2023; Longrich et al., 2022, 2024). In addition to these skeletal discoveries, the Isle of Wight has long been recognised for its globally significant ichnofauna, which provides critical insight into the Wealden Group dinosaur diversity. Several trackways indicate taxa that are currently unknown from skeletal remains (Edgar et al., 2023; Lockwood, 2016; Lockwood et al., 2014; Pond et al., 2014).

The most famous dinosaur tracks on the island are those at Hanover Point where foot casts, which are under the protection of an SSSI (Special Site of Scientific Interest) as well as National Trust and local bylaws, are exposed in the cliffs and foreshore. Unlike the *in-situ* tracks in the foreshore clays, which are often eroded away after large storms, the large sandstone tridactyl casts at the headland are more resistant to erosion, forming an extensive 'boulder field' in Brook Bay. 150 individual casts were recorded between 2005 and 2006, the largest measuring 68 cm in length (Lockwood et al., 2014; Pond et al., 2014). The accessibility of the coastlines, combined with the permanent exposure of the foot casts at the base of the cliff, with new casts eroding from the cliffs yearly, makes the site a major destination for tourists, researchers, and students alike, attracting thousands of visitors annually (Munt, 2016; Simpson, 2018) (Fig. 1).

This paper examines the historiography of these footprints, tracing their discovery, interpretation, and scientific significance within the broader context of palaeontological research on the Isle of Wight.

2. Geological setting of the Wealden Group

The Wealden Group on the Isle of Wight is subdivided into the lower Wessex and upper Vectis formations, with a maximum outcrop thickness of 250 m, exposed along the southwest coast from Atherfield Point to Compton Bay and in Sandown Bay from Yaverland carpark to Red Cliff (Fig. 2) (Gale, 2019). The exposed Wealden Group ranges in age from Hauterivian to early Aptian, with the Hauterivian–Barremian boundary placed near the base of the Wessex Formation (Hughes and

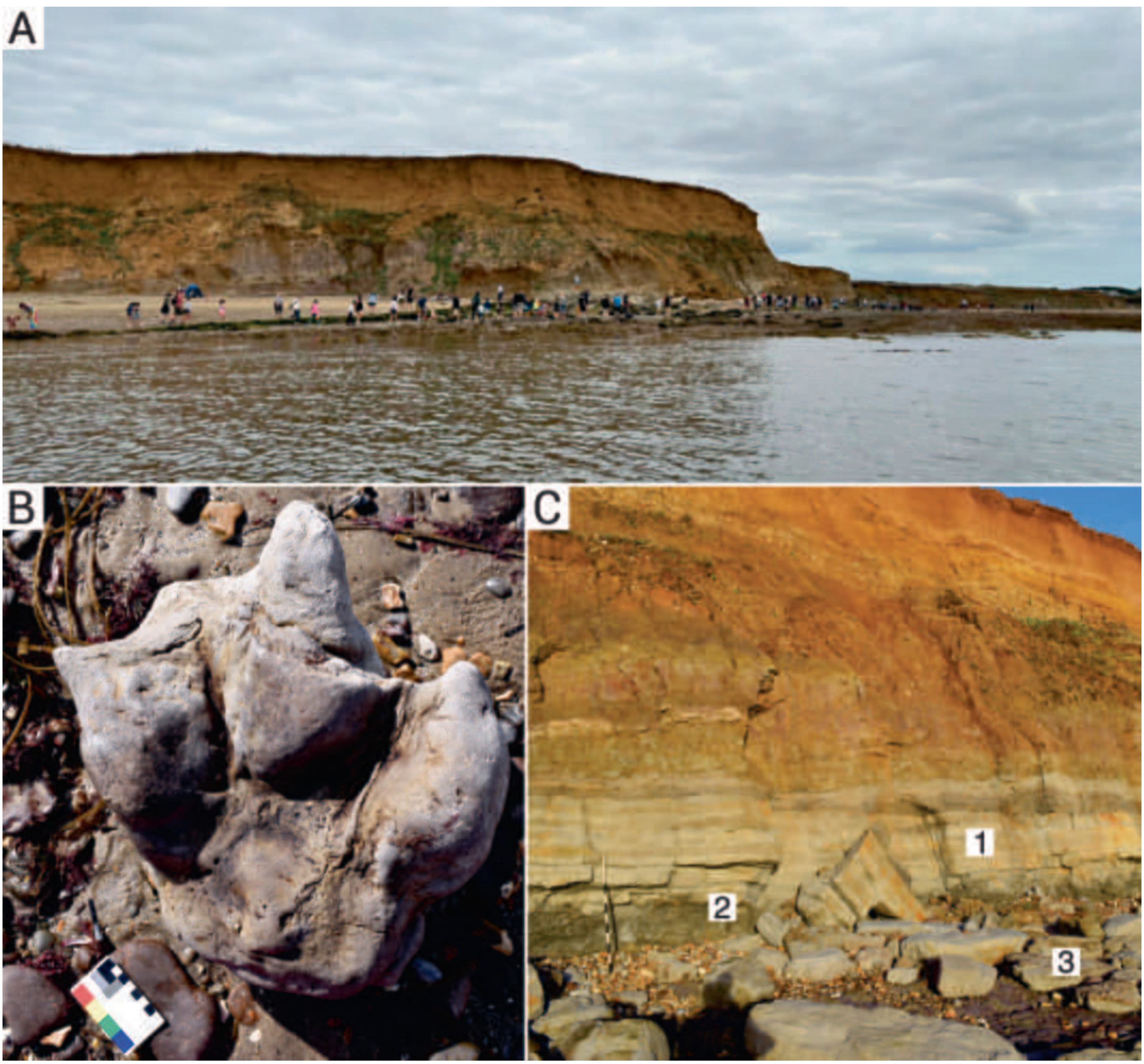

Fig. 1. A, offshore view of Hanover Point showing the large number of tourists visiting in August 2025. Images taken by Theo Vickers. B, ornithopod foot cast at Hanover Point. C, outcrop at Hanover Point showing the 1 Hanover Point sandstone, with 2 dinoturbated ventral surface, and 3 fallen blocks containing foot casts.

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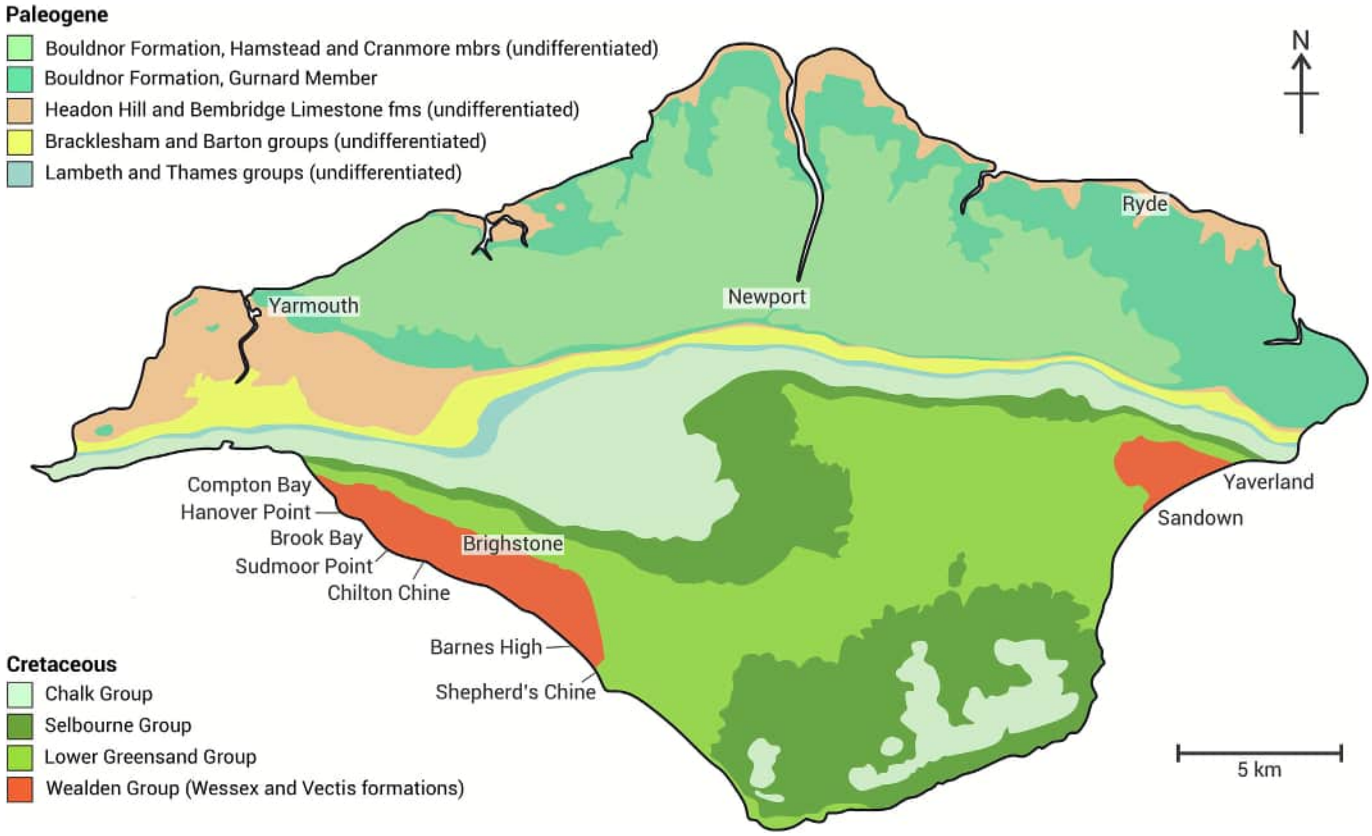

Fig. 2. Geological map of the Isle of Wight showing the outcrop of the Wealden Group.

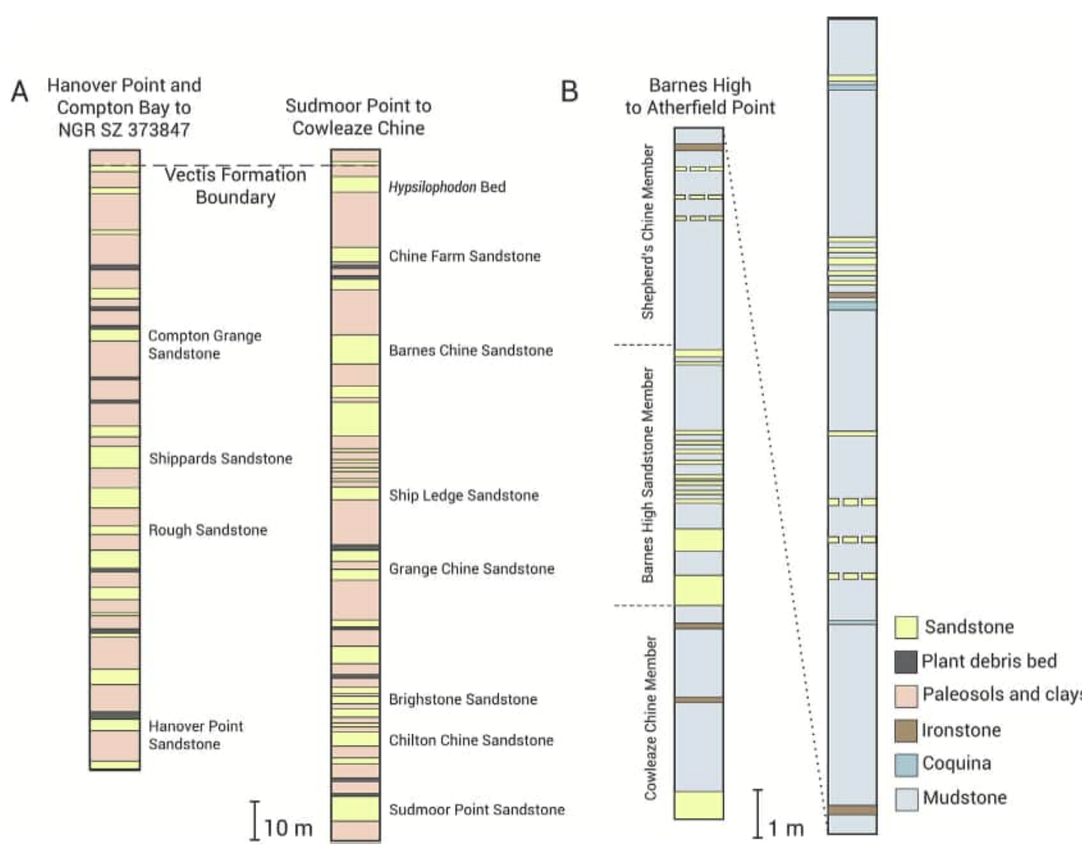

Fig. 3. A, simplified sedimentary logs of the Wessex Formation, redrawn from Sweetman and Insole (2010). B, simplified sedimentary log of the Vectis Formation, redrawn from Radley and Allen (2012).

McDougall, 1990; Jacobs et al., 2023; Gale et al., 2025, p. 49) and only exposed near Sudmoor Point (Fig. 1). The Barremian–Aptian boundary is currently undefined but has been considered to lie either close to the top of the Vectis Formation or just above the Vectis Formation–Atherfield Clay Formation contact (Allen and Wimbledon, 1991; Radley and Barker, 1998).

The exposed Wessex Formation is a 180-metre-thick sequence of sandstones, mudstones and plastic clays (Gale, 2019; Sweetman and Insole, 2010; Wright et al., 2000) with thin intraformational conglomerates and plant debris accumulations (Fig. 3). It represents tropical to subtropical riparian seasonal wetlands with associated major rivers. Annual flooding events created stagnant to periodically oxygenated ponds

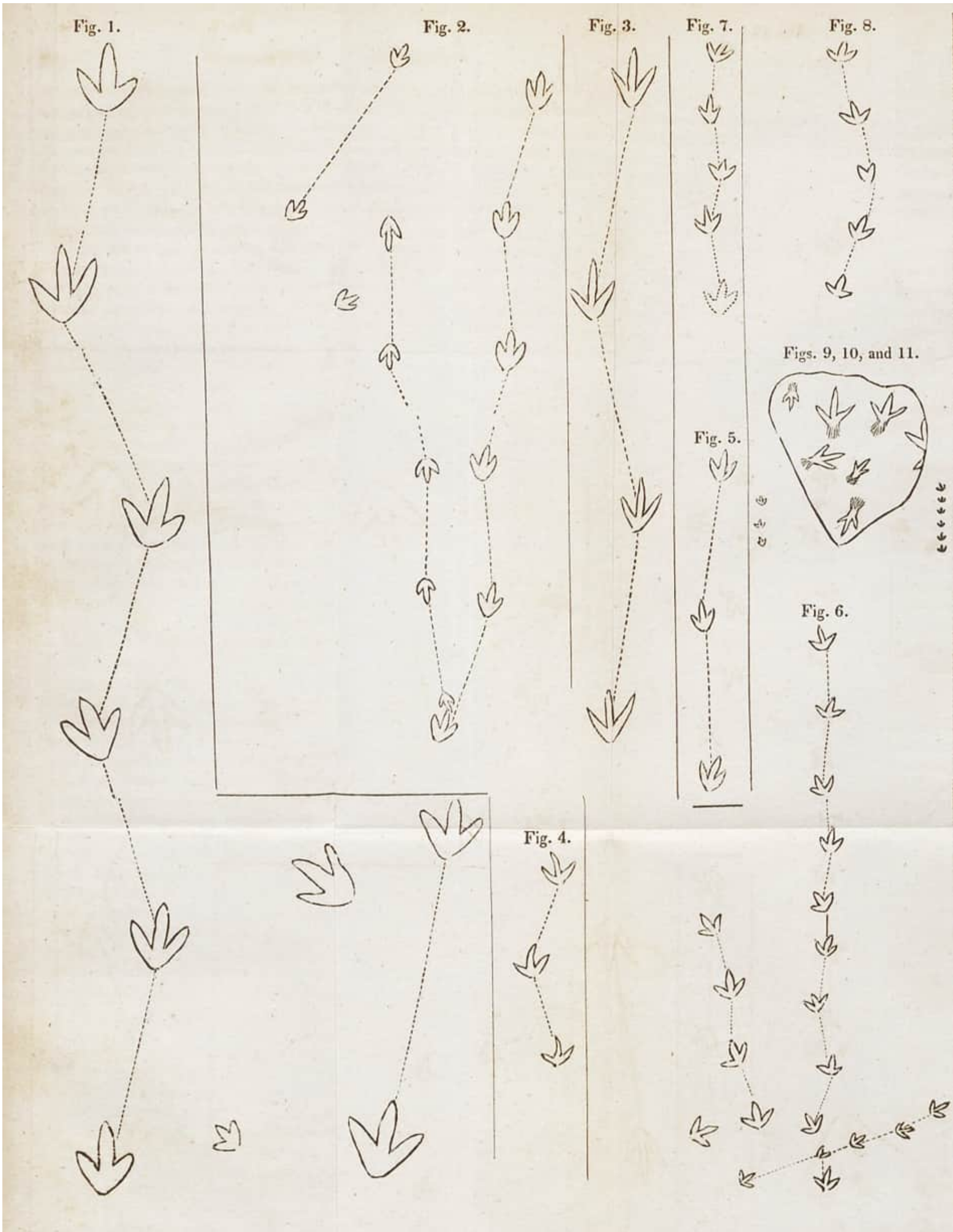

Fig. 4. Early Jurassic trackways referred to as *Ornithichnites* from the Connecticut River Valley, United States illustrated by Hitchcock (1836).

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(billabongs in the sense of Dugan, 1993) which act as traps for localised floods transporting sediments released after wildfires, and a local refuge for fauna during dry seasons (Wright et al., 2000). Reducing conditions in the stagnant ponds led to the preservation of organic matter (lignite, fusain and vertebrate remains) and precipitation of pyrite and siderite, creating what are now named 'plant debris beds' (Wright et al., 2000; Sweetman and Insole, 2010). Seasonal flooding led to the deposition of sheet sandstones, from high energy, high sediment load flows. The sheet sands covered dinoturbated muds, producing natural casts such as those preserved at Hanover Point as hypo reliefs (Lockwood et al., 2014; Pond et al., 2014).

The overlying Vectis Formation is a 70-metre-thick series of mudstones and siltstones, with interbedded sandstones and thin shelly limestones (Allen and Wimbledon, 1991; Gale, 2019; Radley and Barker, 1998; Radley et al., 1998). It is subdivided into three members: the lower Cowleaze Chine Member, a middle Barnes High Sandstone Member, and the upper Shepherd's Chine Member (Stewart, 1981). The Vectis Formation is considered to represent a broad lagoonal complex, with intervals of probable open-marine influence indicated by the fluctuations between freshwater (unionid bivalves) and brackish (corbulid bivalves, oysters) faunal assemblages (Stewart et al., 1991; Yoshida et al., 2001). The Barnes High Sandstone Member likely represents a prograding lagoonal delta, whilst storm events across the lagoon periodically generated coquinas, such as the *Filosina* limestones. These beds not only record storm activity but also acted to infill and preserve dinosaur tracks as natural casts (Radley et al., 1998).

3. 19th century - the beginnings of dinosaur ichnology

The study of dinosaur tracks on the Isle of Wight has its roots in the pioneering ichnological work of Edward Hitchcock in the United States. Hitchcock (1836) described a series of Early Jurassic trackways from the Connecticut River Valley, comprising multiple tridactyl footprints (Fig. 4) that he interpreted as the traces of bipedal animals, most likely extinct birds. He supported this interpretation by comparing them with the tracks of extant fowl, including chickens, geese, and peafowl. He further concluded that the trackmakers were not web-footed, but their prints bore a striking resemblance to those of domestic fowl, particularly chickens and peafowl. Hitchcock also emphasised that the trackways represented continuous step sequences produced by single individuals.

He formally named the three-toed traces *Ornithichnites* and coined the discipline studying such fossils as "ornithichnology." Importantly, he recognised variation amongst the tracks and attributed this to different ichnospecies coexisting on soft, muddy substrates near water sources, describing their morphology and stride patterns in detail.

Whilst Hitchcock was unaware of any such traces on the Isle of Wight, these observations were supported by Dean William Buckland (1836), who figured several of Hitchcock's ichnospecies. Buckland referred to the traces as "footsteps" of avian origin, noting their impressive size, with some examples twice as large as an ostrich print and showing a stride length of up to six feet (1.8 m). He went on to conclude that '*most ancient forms of this class attained a size, far exceeding that of the largest among the feathered inhabitants of the present world*' and they were '*adapted for wading and running, rather than for flight*'. Although he made no mention of Wealden examples, Buckland accepted their avian origins and went on to describe footprints from crocodilians and the Triassic archosaur *Chirotherium*.

The first published reference to potential dinosaur tracks from the Isle of Wight was made by Saxby (1846), who reported small tridactyl impressions in "*flinty-blue rag which forms the bed of the freestone*" on fallen blocks of Greensand on the foreshore at Ventnor (Fig. 5). These specimens are now lost, and thus the true provenance cannot be confirmed. However, the geology in the Ventnor area ranges from the Albian age Gault Clay Formation to the Cenomanian Grey Chalk, all of which are marine deposits (Gale, 2019), so it is highly probable that

Fig. 5. Supposed footprints from the Lower Greensand Group, Ventnor, figured by Saxby (1846).

Saxby had misinterpreted marine trace fossils, such as *Thalassinoides* or flint nodules as vertebrate tracks.

The first definitive reference to dinosaur footprints on the Isle of Wight was that of Gideon Mantell (1846), with a short note of the occurrence of possible '*prints of the feet either of birds or reptiles*' from the shelly limestone slabs from the Vectis Formation at Sandown Bay. Mantell (1854) went on to describe '*concretions*' between Compton and Brook, which were likely the Hanover Point foot casts. Despite the overwhelming evidence and arguments made within previous works (Hitchcock, 1836; Buckland, 1836), Mantell was sceptical of the interpretation that "gigantic extinct birds" produced such tracks. He described the illustrations in Buckland (1836) as '*lucid*', and the '*supposed*' footprints are '*conjectured to have been made by some enormous three-toed reptile*'. Mantell went on to state "*I have never detected unequivocal evidence of footmarks of any kind in the Wealden strata*" and described the origin of the singular concretions as "*very problematical*", but they should be preserved, and if several occur on the same bed, "*their relative position to each other should be carefully ascertained*".

Mantell's reluctance to accept dinosaurian trackmakers is puzzling, given his extensive work on *Iguanodon* bones, including the largest toe bone of an *Iguanodon* he possessed, found on a garden path in Brixton (Brighstone) (Mantell, 1854), so the size of the footprints would not be a factor.

His scepticism was not due to the size of the prints, which matched known osteological material, but perhaps reflected a broader caution in interpretation. His writings also reveal his frustration with local practices, noting with disapproval that villagers collected fossils for use in paving paths and gardens, though he admitted being too occupied professionally to "*remedy the evil mentioned in the text*".

In the early 1850s, Samuel Beckles, a Sussex barrister and fossil collector, began to supplement the works of Hitchcock, Buckland, and Mantell with his own discoveries of tridactyl prints in Sussex and later the Isle of Wight. He first described large bird footprints from Hastings (Beckles, 1851), with a note that Dr. Mantell had discovered similar specimens from the Wealden of the Isle of Wight. Using the casts and footprints found between Bexhill and Hastings and the trackways to support the case these tracks were made by "*bipedal animals with tridactyl feet of enormous proportions*" and the footprint morphologies allied them to birds or "*reptiles with ornithic characters*", a first subtle suggestion that the footprints belonged to *Iguanodon*.

Although the supporting evidence was growing, it could seem that Gideon Mantell still opposed the gigantic bird/reptile origin of the footprints, as Beckles (1854) added the following note: "*With the extensive accumulation of these natural casts in my collection, I felt much surprise that men of real science should still pronounce them mere accidental concretions. The cause, whatever it was, so uniformly produced the same effects, whether in clay-rock, sandstone, or shale, as to be inconsistent with our idea of an accident.*"

Beckles' work on trackways, and the idea that they could be assigned to *Iguanodon* was substantiated by Owen (1858). In a short paper describing a hindlimb discovered by Beckles, Owen noted that the phalangeal formula closely matched that of birds and argued that the similarity between bird and *Iguanodon* feet should not be assumed that the tracks belong to birds and '*adds probability to Mr Beckles' idea of the Iguanodon nature of the large tridactyl impressions*'.

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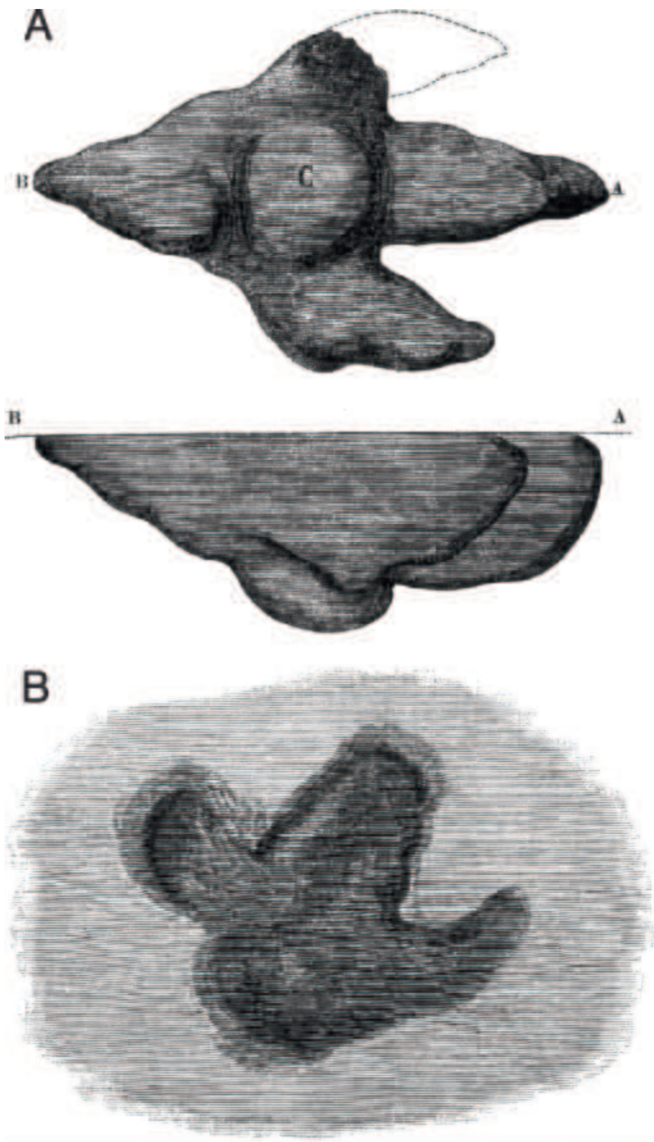

Fig. 6. A, Isle of Wight foot cast and B, field sketch of a footprint figured by Beckles (1862).

Beckles (1862) went on to describe seven new foot casts he had acquired and collected, as well as observed footprints, mostly found between Hanover Point and Brook Chine (Fig. 6). He made special notes on preserved skin impressions, as well as noting a specimen measuring over 90 cm from heel to toe tip.

Beckles proceeded to add supporting evidence to his notion that these footprints were made by *Iguanodon*, as at the time most prints were considerably smaller than those on the Isle of Wight, leading to doubts on the dinosaur origin of the foot casts. Beckles (1862) also reported on an *Iguanodon* phalange and metatarsal of sufficient size to have produced such tracks, providing definitive evidence that *Iguanodon* was the likely trackmaker. He suggested that non-tridactyl footprints might represent other, then-unknown dinosaurs (Beckles, 1862, p. 446).

Following Beckles, Seeley (1870) refers to 'gigantic ornithic footprints' described by Beckles from the Wealden (of Hastings and the Isle of Wight), linking them to new dinosaur taxa under description. The next notable publication (Norman, 1887) mentions 'numerous indentations' at the base of the cliffs, caused by wave erosion, which contain ripple marks (likely the Hanover Point Sandstone, amongst others) and others with desiccation cracks. Norman interpreted these as the footprints of animals, however he added a note to say the footprints are not confirmed. Despite thorough descriptions of other aspects of the Wessex Formation, the work on the foot casts by both Beckles and Owen was not included. However, subsequent works by Harrison (1877) and Bristow et al. (1889) did acknowledge Beckles' discoveries, explicitly noting *Iguanodon* footprints preserved as sandstone casts near Brook Point (=Hanover Point today) and Sudmoor Point (Fig. 3). In 1878, three tridactyl footprints in sandstone ledges off Brook Point were described by Ernest Westlake of Fordingbridge (Delair, 1983), likely the same tracks described by Harrison (1877) the year previous.

4. Early 20th century - the 'dark age' of dinosaur research

The first half of the 20th century produced very few detailed studies of dinosaur ichnofossils from the Isle of Wight (Fig. 7). Geologist Osborne White (1921) briefly noted footprints attributed to *Iguanodon* preserved in sandstone near Sudmoor Point, as well as in a sandstone bed approximately 600 yards (550 m) west of Hanover Point—likely the first published reference to a notable trackway exposed near the so-called "pine raft" on the foreshore at mean low water.

Other passing mentions of *Iguanodon* footprints on the south coast of England, including the Isle of Wight, were made by Hooley (1907), Hughes (1922), and Swinton (1936). However, the majority of

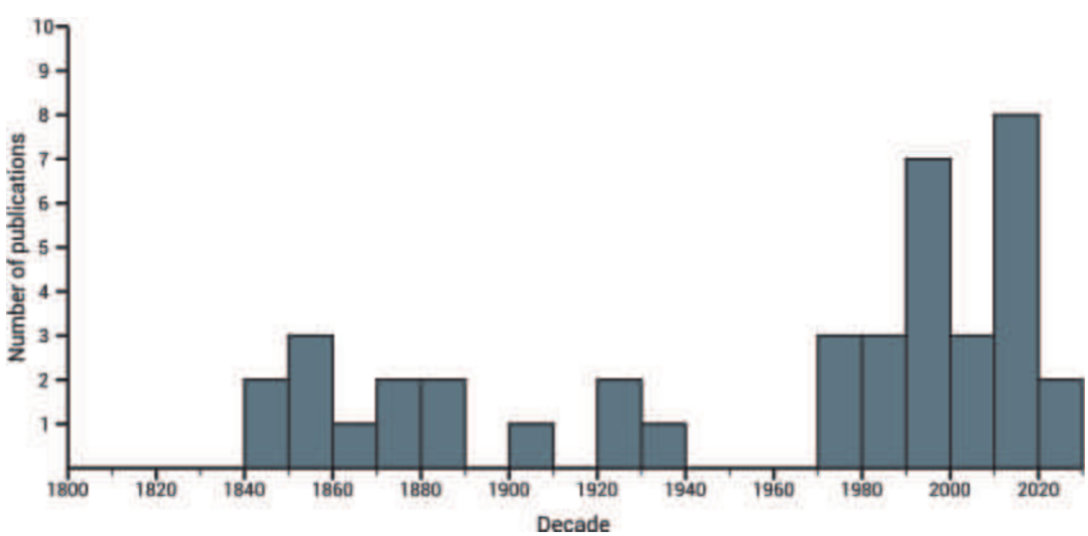

Fig. 7. Bar chart showing the publications on dinosaur tracks of the Wealden Group, Isle of Wight per decade since 1800. This is based on all publications cited in this paper that reference the Isle of Wight dinosaur footprints.

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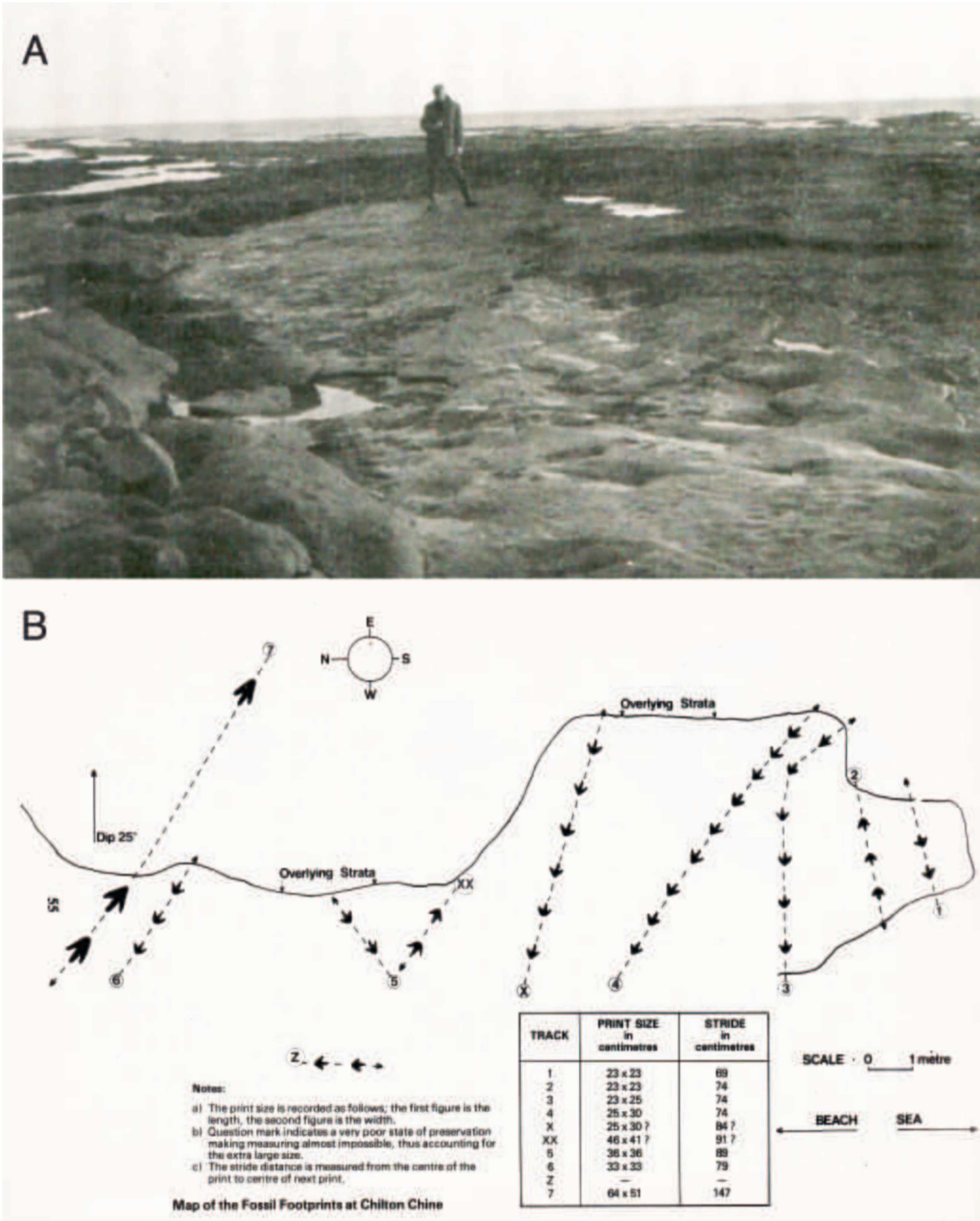
palaeontological research during this period focused on skeletal discoveries, and even these became infrequent, with relatively few publications appearing in the early 20th century. Notable exceptions are the works of Hooley (1913, 1925) and Watson (1930). This decline was likely the result of global and national events, including the First and Second World Wars and the Great Depression of the 1930s. Coastal fieldwork was



TRACK	PRINT SIZE in centimetres	STRIDE in centimetres
1	23 x 23	69
2	23 x 23	74
3	23 x 25	74
4	25 x 30	74
X	25 x 30 ?	84 ?
XX	46 x 41 ?	91 ?
5	36 x 36	89
6	33 x 33	79
Z	—	—
7	64 x 51	147

Fig. 8. A, a photograph of the trackway site at Chilton Chine in 1977, from Blows (1978). B, map of the Chilton Chine trackway site from Blows (1978).

further constrained by wartime defences and minefields along the beaches, whilst subsequent financial austerity and budget cuts reduced opportunities for field-based palaeontology. Consequently, research activity shifted during this period towards 'desk science', focusing on the study of existing museum collections and the synthesis of earlier works.

5. Late 20th century - the dinosaur renaissance

The latter half of the 20th century saw a steady increase in geological research on the Isle of Wight (Fig. 7), coinciding with the rise of the so-called "Dinosaur Renaissance" of the late 1960s and 1970s, a term later coined by Bakker (1975). A pivotal moment in this paradigm shift was John R. Ostrom's discovery in 1964 of a small, gracile theropod that he subsequently named *Deinonychus* (Ostrom, 1969). Ostrom's interpretation, together with Bakker's (1986) influential reconstructions of dinosaurs in dynamic poses and his proposals concerning their physiology, ecology, and behaviour, fundamentally altered global perceptions of dinosaurs. This period marked the transition from viewing dinosaurs as slow, reptilian forms to interpreting them as active, dynamic, and potentially warm-blooded animals (Monnin, 2023).

Parallel to these new initiatives in dinosaur palaeobiology, ichnological research also expanded in scope. Dinosaur footprints and trackways were increasingly examined not only for their morphology and behavioural implications but also as proxies for sedimentological, paleoenvironmental, and palaeohydrological reconstructions (Lockley, 1986). A milestone in this field was the introduction of the term "dinoturbation" by Dodson et al. (1980) who described surfaces heavily trampled by large dinosaurs. These authors further suggested that such trampling could significantly alter sedimentary properties and local habitats, potentially explaining the scarcity of small vertebrate remains in certain horizons of the Morrison Formation in the Western Interior of the USA.

After nearly four decades of relative inactivity, dinosaur research on the Isle of Wight was revitalised with Galton's (1971) reassessment of a small cranial fragment assigned to *Yaverlandia*. Shortly thereafter, the island's dinosaur ichnofauna began to attract renewed attention, with Haubold (1974) briefly mentioning Isle of Wight footprints.

Sarjeant (1974) compiled a comprehensive bibliography of vertebrate tracks from the British Isles, which included a brief section on the Isle of Wight. He noted the 19th-century work of Beckles but remarked that "no further finds have since been reported"—a statement soon overturned. On 5th March 1977, Dr. William Blows discovered a trackway at Chilton Chine. These were the first tracks to be documented on the island since the 1800s (Blows, 1978; Pond et al., 2014). This site consisted of 8 trackways and a total of 37 individual tridactyl pes prints assigned to theropods and ornithopods (Fig. 8).

The first island-wide review of dinosaur ichnofauna followed shortly thereafter, when Delair (1983) summarised the work of Beckles (1854, 1862), Mantell (1854), and Blows (1978). Delair also briefly noted new, but undescribed, footprints from the foreshore at Yaverland found in 1979 as well as from new sites along the southwest coast. Subsequent publications (Delair, 1989; Delair and Sarjeant, 1985; Thulborn, 1990) continued to highlight Blows' discoveries as well as the early observations of Beckles from the previous century. Another notable find of this period was a well-preserved theropod foot cast on a slab of shelly limestone collected near Cowleaze Chine by schoolboy James Crouch in 1984. Young Mr. Crouch later kindly donated the slab to the Museum of Isle of Wight Geology (now Dinosaur Isle Museum) (Radley et al., 1998).

6. 1990s – the birth of 'Dinosaur Island'

A renewed public interest in dinosaurs during the late 20th century was reflected in Isle of Wight tourism campaigns that promoted the island's rich fossil heritage. The Museum of Isle of Wight Geology in Sandown reinforced this image with the publication of a booklet entitled *Dinosaur Island* in 1990, a term that remains in common use today. This heightened publicity not only boosted geotourism but also coincided with an increase in scientific research, including the description of *Neovenator salerii* (Hutt et al., 1996) as well as revisions of previously established taxa (Blows, 1996; Norman, 1998, 1999).

The first figured and published trackways and footprints from the Wessex Formation at Yaverland were described by Radley (1994a). These included isolated footprints, foot casts, trackways, and extensively dinoturbated surfaces across five horizons, representing ornithopods, theropods, sauropods, and ankylosaurs.

This study was followed by Radley et al. (1998), who provided the first detailed description of tracks within the Vectis Formation, which had previously been largely overlooked in terms of vertebrate ichnology (Fig. 9). Their study documented both ornithopod and theropod tracks

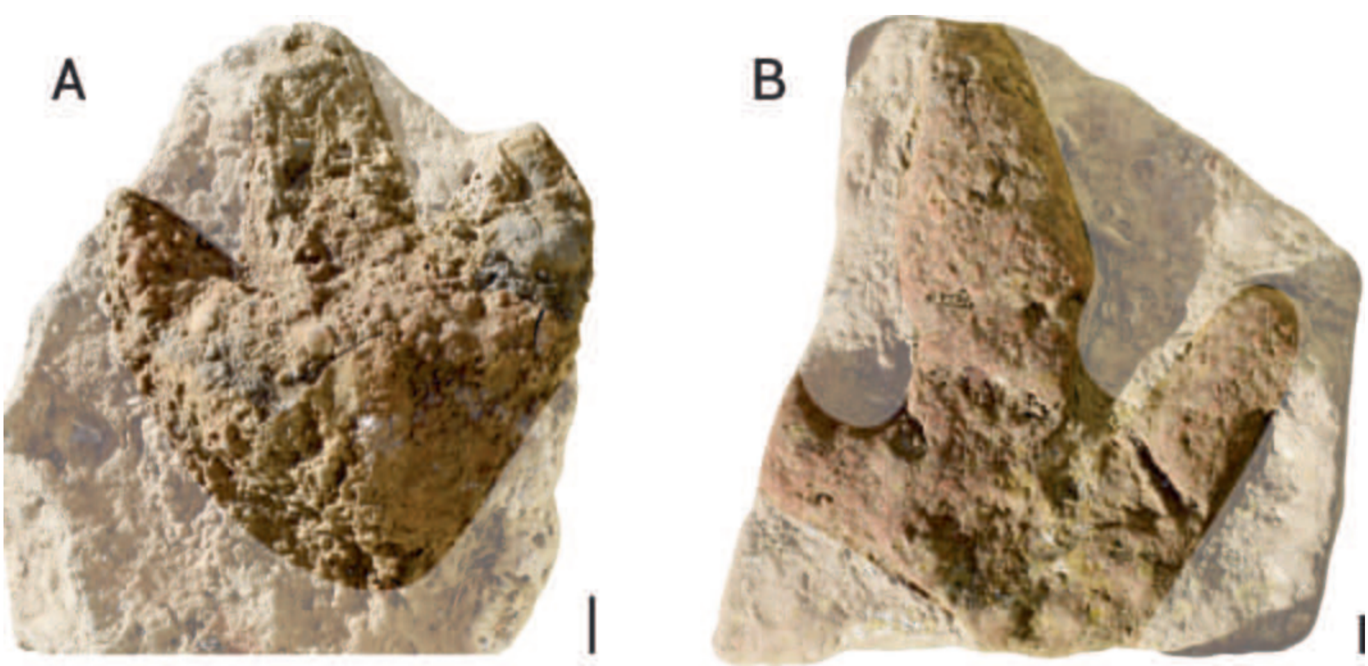


Fig. 9. Vectis Formation foot cast examples. A, small ornithopod cast infilled with *Viviparus* gastropods. B, possible theropod foot cast on a block of *Filosina* bed. Collection of Mr. Downs. Scale equals 10 mm.

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throughout the formation, with some horizons showing heavily trampled surfaces that provide evidence for widespread dinosaur activity on lagoonal mudflats. This is particularly significant given the relative scarcity of skeletal remains from the unit (Hooley, 1925; Clarke and Barker, 1993; Benton and Spencer, 1995). Footprints were observed to become rarer towards the top of the formation. Radley et al. (1998) also used dinoturbation to aid paleoenvironmental interpretation, suggesting that the optimal preservational settings for ichnofossils were marginal or long-standing water bodies, with rapid burial during storm events facilitating their preservation as well as using molluscan and trace fossil stratigraphy to identify the provenance to a horizon of the beach collected foot casts.

Footprints from the Wessex Formation, as well as sandstone casts from Hanover Point, were subsequently figured and discussed in several broader works (Benton and Spencer, 1995; Wright et al., 1998; Insole et al., 1998; Lockley and Meyer, 2000). Sarjeant et al. (1998) named all footprints attributable to *Iguanodon* (or closely related taxa) as *Iguanodontipus burreyi* and provided a discussion of the Chilton Chine trackway. However, because the trackway was documented only through latex casts and was rapidly eroded from the foreshore, it could not be designated as a holotype or paratype of *Iguanodontipus*. Instead, the holotype was assigned to a trackway from the Purbeck Group at Paine's Quarry, Dorset (Sarjeant et al., 1998).

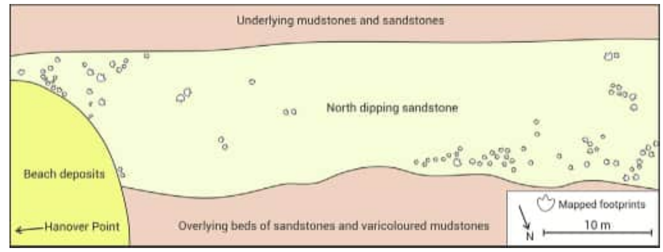


Fig. 10. Footprints on the foreshore at Hanover Point, Compton discovered by Stephen Hutt in 1982. Redrawn from Lockwood et al. (2014). Please note that north is not the top of the map. This plan works for standing on the cliff looking southwards at the foreshore.

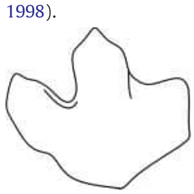
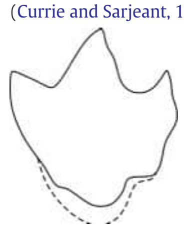
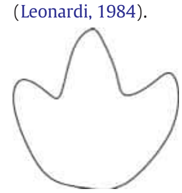
7. 21st century to the new millennium

At the turn of the century, public fascination with dinosaurs grew significantly, and the accessibility of the Hanover Point casts contributed to a rise in geotourism. Hundreds, if not thousands, of visitors travelled to the Isle of Wight each year to hunt for fossils and to view the Hanover Point foot casts (Fig. 1). Booth and Brayson (2011) emphasised the central role of geotourism within the island's tourism industry, noting the Hanover Point casts as a major attraction. This period also saw an expansion of scientific work on dinosaur trace fossils, facilitated by new technologies that improved the description and interpretation of track formation and trackmaker identity. Increased fieldwork, detailed observations, and contributions from local collectors led to the discovery of numerous new footprints and significantly extended the stratigraphical range at which they are preserved.

New foot casts originating from the Vectis Formation, Atherfield were described by Belvedere et al. (2012), who noted that many of these were infilled with the gastropod *Viviparus* and the corbulid bivalve *Filosina*, initially observed by Radley et al. (1998). A storm in February 2007 removed large sections of sand on the foreshore at Sandown, exposing trampled zones of mudstones and sandstones, with trackways and isolated footprints, attributed to iguanodontids, theropods, sauropods and possibly ankylosaurs (Price, 2014). Additional iguanodontid trackways at the base of the Sudmoor Point Sandstone, as well as sauropod foot casts at the base of the White Rock (Vectis Formation), were later described by Gale (2019).

Goldring et al. (2005) and Pollard and Radley (2011) provided brief descriptions, measurements and occurrences of the different types of footprints within the Wealden Group, largely building upon the descriptions of Radley (1994a) and Radley et al. (1998). The importance of Isle

Table 1
Diagnoses for Wessex Formation ichnogenera (after Sternberg, 1932, Sarjeant et al., 1998, Lockley et al., 2014, Diaz-Martinez et al., 2015), with holotypes redrawn from Lockwood et al. (2014).

	Iguanodontipus	Amblydactylus	Caririchnium
Heel shape	Rounded to slightly bilobed heel	Subtriangular heel region	A large heel impression that is rounded, centred and wide
Digit shape	Short, broad, and bluntly terminated digits	Elongate and tapering digits	Short, wide digit impressions
Divarication angle between digits II and IV	40–60°	50–70°	40–60°
Claw mark	Weak or absent	Distinct	Weak or absent
Digit length	Low mesaxony—digit III is not markedly longer than digit II or IV	Strong mesaxony—digit III projects conspicuously forward	Low mesaxony—digit III is not markedly longer than digit II or IV
Other comments	One pad impression in each digit and one in the heel. Well-developed notches in the proximal part of digits II and IV	Lacks discrete pad impressions	Presence of associated manus prints, which are small, rounded and suboval. One pad impression in each digit and one in the heel
Holotypes redrawn from Lockwood et al. (2014).	*Iguanodontipus burreyi* (Sarjeant et al., 1998). 	*Amblydactylus gethingi* (Currie and Sarjeant, 1979).  *Amblydactylus kortmeyeri* (Currie and Sarjeant, 1979). 	*Caririchnium magnificum* (Leonardi, 1984). 

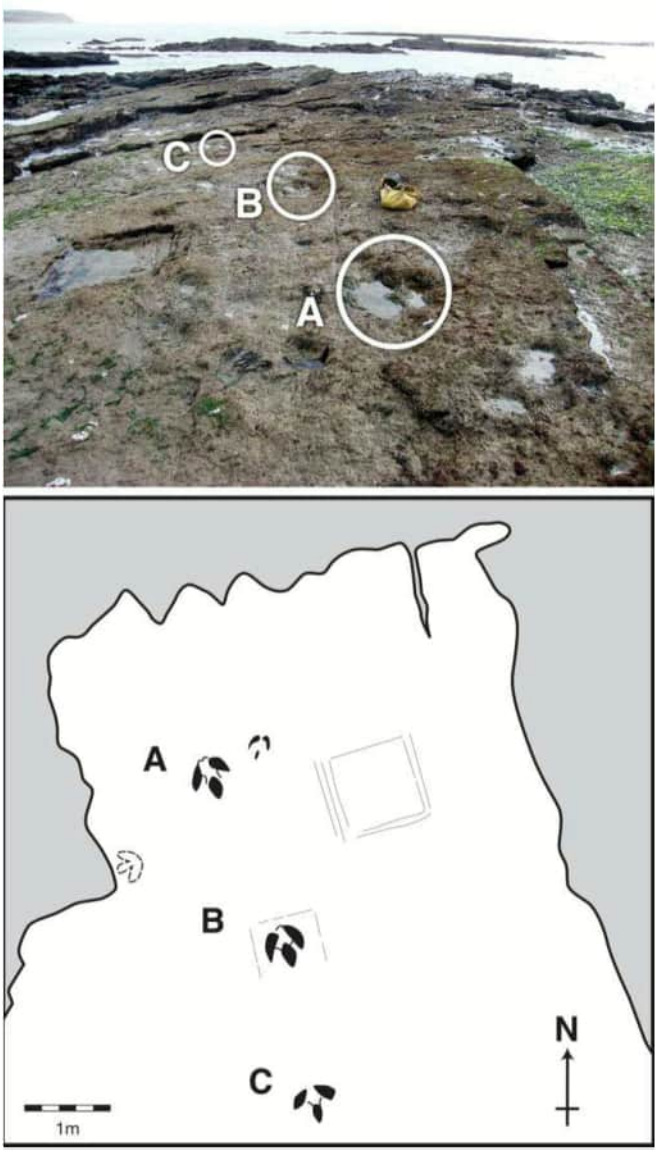


Fig. 11. The Hanover Point trackway illustrated by Pond et al. (2014).

of Wight tracks has also been highlighted in broader works on Wealden fossils (Wright et al., 2000; Martill and Naish, 2001; Lomax and Tamura, 2014).

Historically, iguanodontid prints from the Isle of Wight were assigned to *Iguanodontipus* (Sarjeant et al., 1998). However, Lockley et al. (2014) proposed a revised ichnotaxonomic scheme based on temporal ranges, restricting *Iguanodontipus* to the Berriasian–Valanginian Stages. Under this scheme, the Wessex Formation tracks are more appropriately assigned to *Caririchnium* (Leonardi, 1984), which spans the Barremian to Cenomanian. Lockwood et al. (2014) supported this interpretation but also assigned some of the Hanover Point casts to *Amblydactylus* (Sternberg, 1932) (Table 1). The study also described new trackways and isolated footprints exposed at Hanover Point, initially recorded by Steve Hutt in 1982, as well as documenting 150 footprints and casts recorded between October 2006 and October 2013 (Fig. 10).

A comprehensive review of the Wealden dinosaur footprints was undertaken by Pond et al. (2014), who applied photogrammetry and 3D modelling techniques to produce detailed digital records of the tracks. These methods not only preserved the morphological detail of the tracks but also enhanced the visualisation of features difficult to discern in the field or in photographs. Within this study, a thyreophoran footprint was reassigned to the possible ankylosaurian trace *Tetrapodosaurus* (McCrea et al., 2001). Pond et al. (2014) also re-examined the Chilton Chine trackway, which had previously been attributed entirely to theropods (Blows, 1978) or ornithopods (Delair and Sarjeant, 1985). Using the criteria in Thulborn (1990), they identified a more taxonomically diverse assemblage comprising three small and five large theropods alongside three large ornithopods, all moving at a walking pace. Moreover, this study was the first to publish figures of the Hanover Point trackway (Fig. 11) and applied calculations (from Thulborn, 1990) to estimate hip height and relative speed, providing new insights into the locomotion of the trackmakers. As well as the occurrence of the Hanover Point foot casts having smaller theropod casts on the ventral surfaces (Fig. 12).

The ichnological record at Hanover Point was further expanded by Lockwood (2016), who described the first definitive theropod foot casts from the site, reinforcing evidence for a diverse theropod fauna within the Wealden deposits of the Isle of Wight.

A review of UK dinosaur track sites was provided by Edgar et al. (2023), shortly followed by a study by Edgar et al. (2025) that assessed the relative scientific and cultural value of *in-situ* dinosaur track sites using a quantitative evaluation framework. Their findings identify

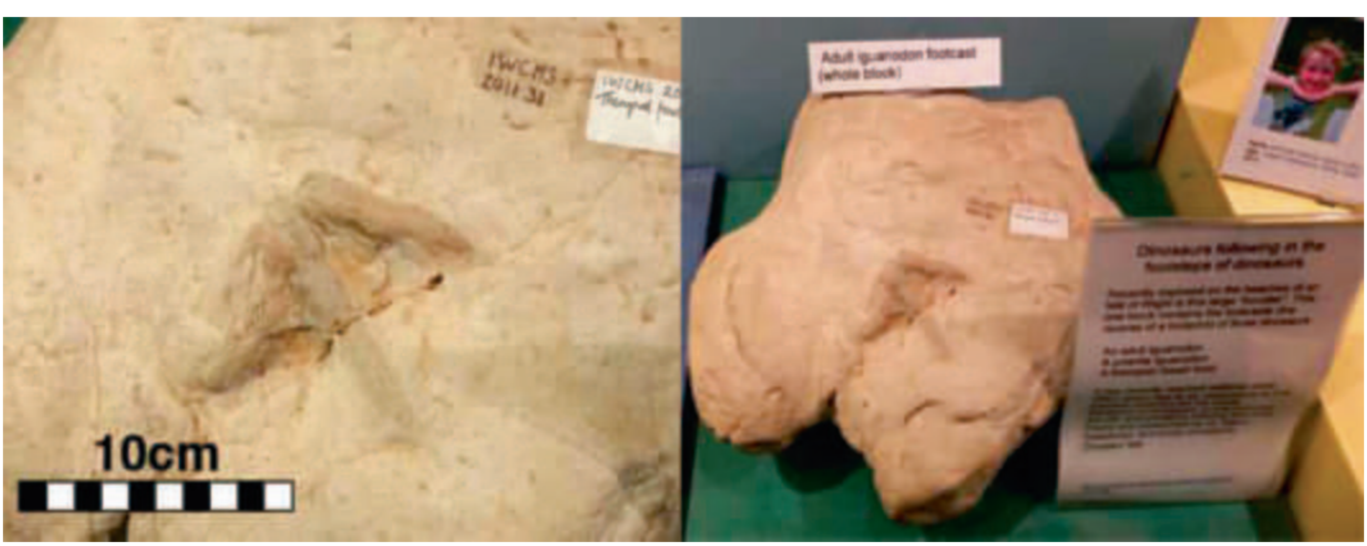


Fig. 12. Ornithopod foot cast IWCMS 2011.31, with a small theropod cast on the surface. From Pond et al. (2014).

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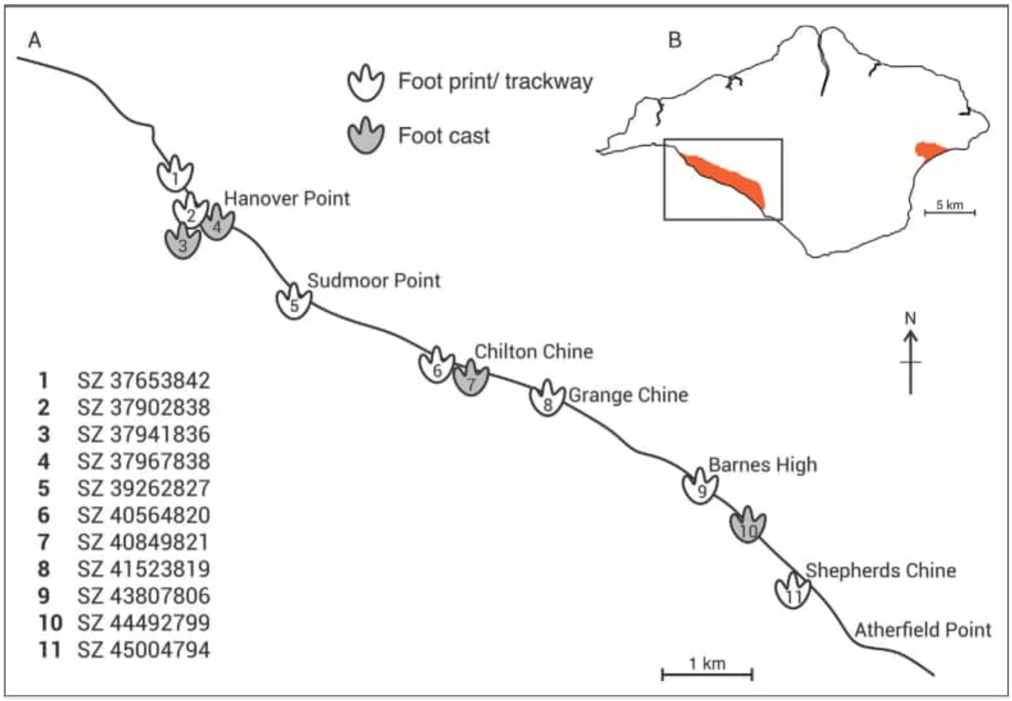

Fig. 13. A, localities of described track sites on the southwest coast of the Isle of Wight. B, outcrop of the Wealden Group of the Isle of Wight, with a box indicating the area illustrated.

the Hanover Point trackway and foot casts as both scientifically significant and amongst the highest-ranking sites for cultural value, reflecting its long research history (Fig. 7) and strong public engagement (Fig. 1).

8. Significance of dinosaur tracks in the Wealden Group

The record of dinosaur tracks in the Wealden Group provides critical insights into dinosaur diversity, abundance and behavioural information that is not available from skeletal remains alone. Tracks occur within horizons that lack identifiable skeletal remains (Fig. 13, Fig. 14), which is particularly significant for the Vectis Formation, where dinosaur body fossils are exceedingly rare (Batten, 2011). The ichnological record confirms the presence of theropods, ornithopods, and ankylosaurs in the Vectis Formation (Pond et al., 2014), demonstrating that the apparent absence of dinosaurs in the skeletal record is misleading.

The occurrence of high densities of footprints within single stratigraphical horizons, including extensively trampled surfaces such as those observed at Chilton Chine and Compton (Blows, 1978; Lockwood et al., 2014), suggests that large numbers of dinosaurs inhabited the Wessex Formation floodplain simultaneously. The wide range of footprint sizes on these surfaces indicates the presence of individuals of different ontogenetic stages and as well as multiple taxa. In some cases, smaller footprints are preserved within larger foot casts (Pond et al., 2014), implying either repeated use of the same pathways or movement of smaller individuals alongside larger ones. This pattern may reflect herd structures composed of either single species with age

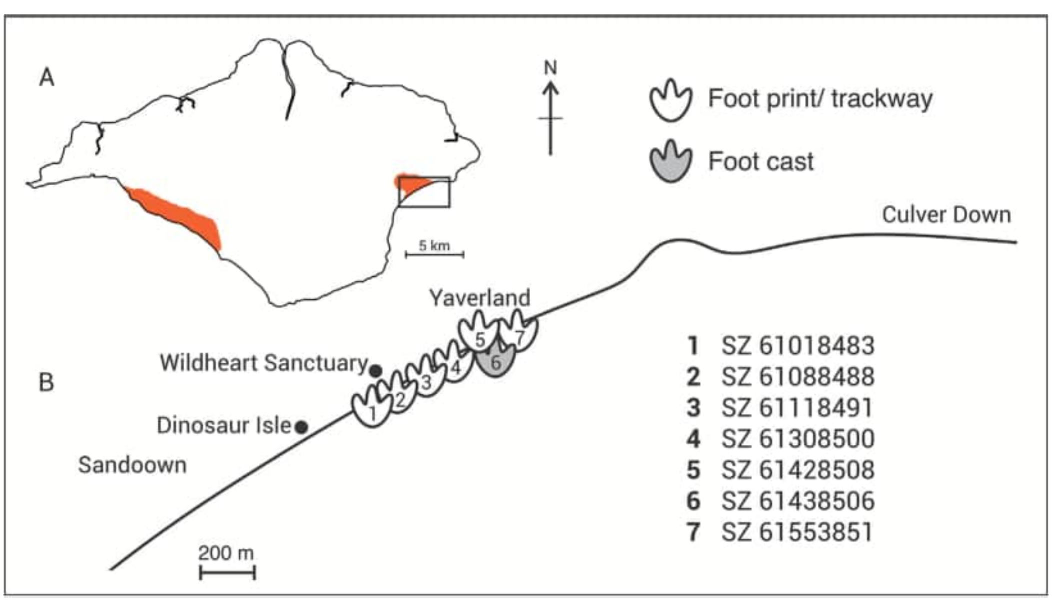

Fig. 14. A, outcrop of the Wealden Group of the Isle of Wight, with a box indicating the area illustrated. B, localities of described track sites at Yaverland, Isle of Wight.

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variation or multiple coexisting taxa, providing rare behavioural evidence within the Wealden Group dinosaurs.

Footprints attributable to large- and small-bodied iguanodontids are relatively common, especially preserved at Hanover Point as foot casts, with maximum foot lengths reaching 68 cm (Lockwood et al., 2014), and minimum lengths of 20–25 cm. However skeletal remains of large and small individuals of corresponding footprint sizes are incredibly rare, with the exception within one horizon, the *Hypsilophodon* bed, which yields a high concentration of *Hypsilophodon* skeletons (Coram et al., 2017; Marsden et al., 2025).The majority of skeletal remains of iguanodontids have a bias towards medium sized animals, such as *Brighstoneus*, *Comptonatus* and *Istiorachis*, with an average hip height of 1.5–2 m (Lockwood et al., 2021, 2024, 2025). The diversity of theropod tracks, both in size and morphology (Lockwood, 2016) also do not reflect diversity from body fossils alone (Martill and Naish, 2001; Benson et al., 2009; Barker et al., 2021, 2022; Naish and Cau, 2022; Longrich et al., 2022). These discrepancies highlight the preservational bias affecting body fossils, underscoring the importance of ichnological data for reconstructing dinosaur communities.

9. Legal protections and conservation

Dinosaur footprints on the Isle of Wight are vulnerable to both natural and human-induced damage. Rapid erosion of foreshore clays, combined with storm events, can destroy *in situ* tracks, whilst large sandstone foot casts, although more resistant, remain at risk from ill-informed fossil collectors. One example is the theft of a footprint from the Hanover Point trackway in 1994, where power tools were used to cut out one footprint, and damage was done to a second (Radley, 1994b) as well as theft of foot casts from Hanover Point using wheelbarrows and vehicles to remove them from the beach, which resulted in the culprit returning the cast after being interviewed by local police (Radley, 1993).

Legal protections play a critical role in conserving these ichnofossils, as well as body fossils. All of the track-bearing sites on the Isle of Wight fall within Sites of Special Scientific Interest (SSSIs), providing statutory protection under the National Parks and Access to the Countryside Act (1949), the Countryside and Rights of Way (2000). These acts state that third parties that knowingly or recklessly undertook damaging activities upon an SSSI become legally liable for their actions. The Wildlife and Countryside Act 1981 (as amended) prohibited the removal or destruction of protected geological features, although permission can be gained by Natural England for *in-situ* collecting. Much of the islands' coast is privately owned or owned by the Isle of Wight Council, so landowners' permission is also needed alongside the permission from Natural England. Without permission, accessing the land could fall under the offence of trespass. Although this is usually a civil offence, rather than a criminal offence, so the owner would have to take the issue to civil court. However, trespassers who damage land or anything on it, or remove items from the land may be guilty of criminal offences, including criminal damage and theft (Taylor and Harte, 1988).

For National Trust land, the National Trust bylaws of 1965 state that no unauthorised person shall dig, cut or take turf, sods, gravel, sand, clay or any other substance on or from Trust property. Whilst not explicitly mentioning fossil collecting or geological heritage, it does prohibit *in-situ* collecting, or removal of material without prior permission from the National Trust. This was further publicised in 1991, the National Trust published a statement which allows the collecting of loose, small fossils at Compton and Brook bays (Trust owned/managed land), however specimens (fossils and foot casts/prints) which require tools and equipment to remove them from the beach are only allowed to be collected with the written permission from the trust (Simson, 1991).

To mitigate these threats, modern conservation and recording strategies employ digital documentation methods, including 3D scanning, photogrammetry, photographic records, and detailed measurements, often tied to precise GPS coordinates. These techniques preserve the morphological details of footprints and trackways, with the data published in an open access achieve, enabling long-term study even if the original specimens are lost or damaged (Pond et al., 2014). Nature Conservation Authorities also have a statutory duty to monitor SSSIs of their conditions, assessing and documenting any damage, site changes such as vegetation growth, dumping of material and recreation/disturbance (including fossil collecting, graffiti, and off-road vehicle tracking) and erosion (Wignall et al., 2023). Together, these measures combine regulatory oversight, active site management, and modern documentation techniques to ensure the preservation of the Isle of Wight's globally significant dinosaur ichnofauna for scientific, educational, and public engagement purposes (Munt, 2016; Simpson, 2018; Edgar et al., 2025).

10. Conclusions

The Isle of Wight's dinosaur footprints, preserved alongside dinosaur skeletal remains, offer a uniquely detailed window into Early Cretaceous fluvio-lacustrine ecosystems. The historiography of these ichnofossils records nearly two centuries of discovery, interpretation, and conservation—from the early 19th-century observations influenced by Hitchcock (1836) to the studies of Beckles, Owen, and their contemporaries—demonstrating their enduring contribution to understanding the Wealden Group's paleoenvironment and faunal diversity. In the late 20th and early 21st centuries, renewed scientific and public interest, aided by technologies such as photogrammetry, 3D modelling, and precise GPS-based recording, alongside the rise of geotourism at accessible sites like Hanover Point, has further highlighted their significance. Continued study and conservation of both skeletal and ichnological evidence ensure that these remarkable Early Cretaceous ecosystems remain accessible for research, education, and public engagement for generations to come.

CRediT authorship contribution statement

Megan L. Jacobs: Writing – review & editing, Writing – original draft, Visualization, Software, Project administration, Methodology, Investigation, Data curation, Conceptualization.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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