POPULAR EXHIBITIONS, SCIENCE AND SHOWMANSHIP, 1840–1910

EDITED BY

Joe Kember, John Plunkett and Jill A. Sullivan

PICKERING & CHATTO
2012
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In the early afternoon of 12 May 1905, an illustrious gathering occupied the Hall of Reptiles of the British Museum (Natural History). The occasion was the unveiling of a cast of the North American sauropod dinosaur Diplodocus carnegii (or carnegiei, as incorrectly reported in most media), a gift of the Scottish-born American steel baron Andrew Carnegie (1835–1919) to the institution, by way of King Edward VII. For Carnegie, it was a moment of triumph for himself, for his charity campaigns, and for American drive and entrepreneurship. And maybe for that reason, some of the parties present regarded the gift with mixed feelings. Indeed, it was placed in the Gallery of Reptiles rather than the Gallery of Palaeontology because, as Museum Director E. Ray Lankester (1847–1929) did not forget to point out, that was already full of British dinosaurs. Lord Avebury, who accepted Carnegie’s gift on behalf of the museum’s trustees, was also somewhat condescending:

The size of the animal does not indeed necessarily add much to the interest ... Still, size appeals to the imagination, and I do not doubt that this specimen will excite the admiration and wonder of all who see it.²

Conversely, the press and the public’s response was unequivocal. With some pride, the technician responsible for mounting the dinosaur, Arthur Coggeshall, would later claim that more visitors had come to see Diplodocus than had ever before visited the museum after its opening day in 1881.³ The number might have something to do with the amount of dignitaries present: as well as Lankester and Avebury, Carnegie himself had made an appearance. But the main attraction was doubtlessly Diplodocus itself. 26 metres (85 ft)-long and 8 (26ft)-metres high, it was one of the largest dinosaurs known at the time and, despite being ‘only’ a copy, the largest skeleton mount on display in the world (the original in Pittsburgh would not be mounted until 1907).
As we shall see, however, Diplodocus’s fame was to extend far beyond the confines of London’s Hall of Reptiles. Copies of Carnegie’s Diplodocus were donated to various major European and South American natural history museums and this essay demonstrates how international politics influenced its reception and exhibition. Much recent work has emphasized the geographically situated nature of scientific knowledge, and the determining effect of local and institutional spaces. Such work has tended to focus on Anglo-American spaces; however, Diplodocus demonstrates the benefits of a more transnational approach. Heated arguments over its ‘natural’ posture divided not only along national lines but were influenced by the interlocutors’ institutional affiliations, with a split between those supposedly concerned only with scientific rigour and those who took into account how it might most impressively be displayed to the public. The dissemination of Diplodocus also reveals an often overlooked aspect of the way scientific objects are exhibited, namely the importance of the cultural and personal politics of the donor-recipient relations, and the often tense relationships between different recipients and audiences of the same object. Sadiah Qureshi’s essay in this volume (Chapter 10) similarly traces the interpersonal politics of relations between the showman-lecturer and the Zulu people he transported and managed. Qureshi is able to excavate the agency of the Zulu performers, while Diplodocus offers no such possibility; its meaning was in any case over-determined by the larger-than-life character of Carnegie.

The Carnegie Museum’s discovery of a giant dinosaur was not unique, yet ‘Carnegie’s’ Diplodocus gained unprecedented status because of the uses to which it was put and the channels that were used to publicize it. For the press, both the animal itself and its connection with high politics were ample justification to exhaust itself in superlatives. What made it even more attractive was its ambivalence, a combination of awe and ridicule. The rich American capitalist Carnegie was also regarded as something of a parvenu; likewise, powerful potentates were seen to make fools of themselves by begging for a copy of his dinosaur. This offered a welcome opportunity to poke fun at the expense of the high and mighty. And Diplodocus itself, although big and powerful, was also time and again emphasized as being a slow and stupid animal – and therefore an attractive metaphor for its country of origin.

Diplodocus’s prominence in the public sphere and even in politics also had consequences for the treatment of the animal in scientific circles. Even by early twentieth-century standards it was not particularly interesting from a scientific viewpoint since many other sauropods had been known since the 1870s. But otherwise obscure deliberations gained far more prominence now that they concerned a ‘famous citizen’. Recent scholarship has focused on the intense race to excavate large dinosaur fossils that took place in the Americas and the (often unscrupulous) competition between wealthy American museums and competi-
Yet while critics acknowledge that a copy of Carnegie’s Diplodocus was the first dinosaur skeleton seen by millions of people in Europe, there has been little attention to the specificities of its European reception and appropriation.

A Dinosaur in the Trenches

Unquestionably, the tank resembles an armadillo, a caterpillar, a diplodocus, a motor car, and a traveling circus. It has more feet than a caterpillar, and they have steel toenails which take it over the ground; its hide is more resistant than an armadillo’s, and its beauty of form would make the diplodocus jealous. No pianist was ever more temperamental; no tortoise ever more phlegmatic.

Thus, the American war correspondent Frederick Palmer (1873–1958) recalled the impression the tanks of the First World War left on him. His choice of analogies is telling, but not unique; the description of tanks as ‘diplodocus’ appears to have been common in the trenches. Over time, these massive dinosaurs came to signify much of the sentiment that had been left by the first tanks: powerful, yet ungainly; vigorous but devoid of intelligence. Palmer’s connection of the diplodocus with beauty is actually quite exceptional. But the most significant fact is that the animal had apparently become such a well-known beast that soldiers of various nationalities could all understand its similarity to the armoured vehicle.

No one was more responsible for the beast’s notoriety than Carnegie. A man of grand gestures, he had fostered an interest in grand animals for some time in addition to other, equally ambitious interests, such as single-handedly securing world peace. When he opened his copy of the New York Journal in November 1898, he was greeted by the image of a dinosaur peeping into the tenth storey of a skyscraper (a motif that often returns in depictions of dinosaurs). The newspaper, one of the more lurid examples of ‘yellow journalism’, reported the find of the ‘Most colossal animal ever on earth’ in the American west. Carnegie immediately cabled the director of his natural history collections, William Holland (1848–1932), with the order to secure such an animal for his museum. Having received Carnegie’s order and bolstered by a generous stipend, Holland sent a team of fossil-hunters to go prospecting in Wyoming. After an initial lack of success, they were able to report the discovery of the first skeleton of what was to become Diplodocus carnegii by early July 1899, and later that year most of its remains were safely ensconced in Pittsburgh. After Diplodocus, several more dinosaurs were discovered in its vicinity: Apatosaurus (often referred to popularly as Brontosaurus), Camarasaurus and Stegosaurus, to name just a few, were amongst those unearthed that were destined to become important parts of the dinosaur canon.

Although the remains were impressive and more complete than any large dinosaur found until then, they were hardly revolutionary. What propelled Dipl-
lodocus to stardom took place shortly after a description of the species had been published by John Bell Hatcher (1861–1904) in 1901.\textsuperscript{10} It was occasioned by a conversation that took place between Carnegie and his guest, King Edward VII, which Holland later recalled in his 1913 book \textit{To the River Plate and Back}. When he wrote it up again in 1930, it gained an almost caricature-like quality:

The king saw the sketch [of Diplodocus's skeleton] and, adjusting his glasses stepped forward, exclaiming: 'I say Carnegie, what in the world is this?' Mr. Carnegie replied, 'The hugest quadruped that ever walked the earth, a namesake of mine.' We had already published a preliminary description and had named the animal in honor of Mr. Carnegie, \textit{Diplodocus carnegiei} [sic]. ‘Oh! I say, Carnegie’ replied the King, ‘we must have one of these in the British Museum’.\textsuperscript{11}

The king was referring to a reconstruction of Diplodocus's skeletal remains, taken from Hatcher's paper, hanging on the wall of the drawing room at Skibo castle. A few days later Carnegie wrote to Holland, asking whether it were possible to procure another specimen for setting up in the Natural History Museum in London. Holland, knowing that finding a comparable specimen in the near future would be impossible and perhaps fearing that his treasured original might end up overseas, suggested the British might be plied with a plaster copy of the bones that were available in Pittsburgh, rather than the real thing.

Holland himself had been a newcomer to the field of vertebrate palaeontology in 1899; and although he might have learnt a thing or two about bones, had he been an expert in the field of plaster casting he might have realized that casting so many objects of such size was a task hardly less daunting than finding a new specimen. A small army of plasterers, most of them Italians, was hired to manufacture moulds from the original bones and prepare the cast, under the direction of Chief Preparator Arthur Coggeshall. And while housing the regular collections and staff in the cramped premises of the Carnegie Museum had been problematic (a new building was under construction, but would not be finished until 1907),\textsuperscript{12} also fitting in what quickly became a horde of plasterers proved nearly impossible.\textsuperscript{13} Instead of preparing just one cast, Holland and Coggeshall decided to produce seven instead. There had been some inkling that Diplodocus might be in demand outside the United Kingdom as well. Just after the news of Carnegie's donation to London had become public, the director of Paris's \textit{Musée d'Histoire Naturelle}, Marcellin Boule, had already inquired whether a swap for a cast of Diplodocus might be possible.\textsuperscript{14} Of course, a swap was something quite different from a donation – and part of Carnegie's desire to donate the animal was that he wanted to be seen to be generous in the company of the world's leaders. So, donations they would become.

Word obviously had gotten out that along with the London Diplodocus several other copies had been prepared. Just after the London unveiling, Hans Schauins-
land, the director of the Bremen City Museum for Natural History, Ethnography and Trade, inquired whether he might be the recipient of a copy. When doing so, he specifically referred to the high number of American visitors that would be passing through the museum – and totally misjudged Carnegie’s motivations. For although Schauinsland’s museum was the most-visited German natural history museum by some distance (with just over 110,000 visitors compared to Frankfurt’s 20,000 and Berlin’s 50,000), the aura of Bremen was not the same as Berlin. And Holland, who had stalled for some time in the case of Boule, showed no qualms about denying outright that any copies were being made to Schauinsland.

Fame

It took the Pittsburghers the better part of a year to manufacture the casts, ship them to London and have them mounted. The press immediately seized upon the animal; what seemed to impress them most was its size – the largest British dinosaur was after all, as the *Daily Graphic* noted, ‘some twenty feet shorter and three feet lower’. London’s lively satirical magazines had a field day: the *Sketch* saw a *Diplodocus* fad on the horizon, while *Punch* held the opinion that in exchange for the *Diplodocus* the Americans might appreciate a copy of Director Lankester. But the contrast between the animal’s size and its perceived intelligence was not lost on them as well, especially after Avebury had emphasized it in his acceptance speech. It helped to cement the impression of slow, plodding creatures that possessed more bulk than was good for them. Yet the public seemed not to care: immediately, and the sceptics notwithstanding, *Diplodocus* became one of the museum’s most popular exhibits. And it was not only the popular press that was interested – the professional scientific community was not blind to the significance of the event.

The original from which the London copy had been cast was unveiled in the new Carnegie Museum in April 1907. Among those present, beside Carnegie, Holland and various other dignitaries, were representatives from both the German Kaiser and the French president. After an exchange of presents, Carnegie ordered Holland to prepare additional casts for the museums in Berlin and Paris. Of course, competition ensued between the two rival nations as to who was to receive their *Diplodocus* first. The French delegation, which remained interested but non-committal for a long time, soon found themselves overtaken by the Germans, who had immediately proposed a timeframe and a date. The Berlin skeleton would be the first to be erected, followed one month later by the Paris copy.

**Frankfurt First**

However, the Berlin *Diplodocus* exhibit would not become the first on the European continent: Henry Fairfield Osborn’s (1857–1935) American Museum of Natural History (AMNH) in New York saw to that. While Holland was deal-
ing with casting the copies that needed to be delivered to Berlin and Paris, the American Museum shipped nothing less than an original Diplodocus to Frankfurt's Senckenberg Museum. The gift was the result of the friendship between the American Museum's director, Morris K. Jesup's, and Jacob H. Schiff. Schiff had assisted the American Museum in negotiations to display part of the famous Frankfurt Herbarium Senckenbergianum in New York. Diplodocus was therefore a token of Jesup's appreciation for Schiff's home town of Frankfurt, and would help to celebrate the opening of the museum's grand new buildings.

At the time, the Senckenberg was one of the institutions in Germany vying to rival with the Berlin Museum für Naturkunde in terms of scientific and public pre-eminence. Jesup's shipment consisted of a number of Diplodocus bones, essentially leftovers from the AMNH's Wyoming expedition which by no means made up a complete skeleton. However, both problems of presentation and construction were solved by encasing the bones in a framework of wooden and plaster boxes – twenty-three in total, weighing 7.3 metric tons. Missing bones, mainly in the tail and neck, were drawn in to create the illusion of a complete skeleton. This also made final assembly much easier because it entailed little more than stacking the boxes in the right order.

The donation was well advertised, both the American Museum and the Senckenberg calling in favours from the press. In the United States, an entire issue of Scientific American was devoted to it, which described in detail the way in which the animal had been prepared and would be erected. It was unveiled at a festive ceremony on 13 October 1907. Frankfurt had tipped Berlin to the post, and with an original animal (part of one, anyway) instead of a copy. The display might have left something to be desired and their Diplodocus longus might have been quite a bit smaller than the one Berlin was anticipating, but the Frankfurt public did not care; in their masses they flocked to gawk at the museum's new acquisition. It is difficult to determine the degree to which the fanfare concerning the Frankfurt dinosaur influenced the remarkable lack of pomp and circumstance that surrounded the unveiling of Carnegie's donation to the Kaiser barely a year later. The satirical weekly Kladderadatsch made mention of the 'wandering friend' Diplodocus, but also noted how it acted as a vehicle for Carnegie to further his relations with the 'crowned heads'. Various magazines made note of the erection of the Berlin Diplodocus, but not nearly as many as in London three years earlier. And although Holland might have been celebrated at a dinner in the lavish surroundings that was the Hotel Adlon on 14 May, neither Carnegie nor the Kaiser made an appearance. Even editors of the the popular illustrated weekly Die Woche, who had initially (but apparently without success) been requesting a photo shoot of Holland beside the animal, devoted a few pages to the Carnegie Museum's palaeontology collections, which made remarkably little mention of Diplodocus.
Figure 12.1: Arthur Coggeshall and William Holland before the Paris *Diplodocus* (second and third from left), 1908; reproduced with permission of the Bibliothèque Nationale Française, Paris.
About a month later, Holland and his assistant (see Figure 12.1) were to discover that the French approached the unveiling rather differently. A whole hoard of dignitaries put in an appearance, headed by none other than the President de la Republique, Edouard Faillières. Holland was bestowed with the Légion d'Honneur, and Coggeshall was made an Officer of Public Instruction. As a consequence, the French press devoted much more column space to it than their German colleagues had done the month before, and as much in the society pages as in the scientific reports. Paris's newspapers were positively rhapsodic about the animal and the event, even if they could not resist taking a stab at some of the dignitaries present. *Le Matin* saw more than one 'heavy and stupid animal' roaming the museum, and took the opportunity to make merry with the *Fallierus elyseensis*.

More requests from European dignitaries found their way to Carnegie, who was only too eager to honour them. For the next four years, Holland spent much of his time preparing copies to ship to European museums: to Vienna and Bologna in the autumn of 1909, to St Petersburg in 1910 and Madrid in late 1913. And everywhere he went accompanied by Coggeshall and thirty-two to thirty-six crates containing just over two hundred *Diplodocus* parts. But the most adventurous expedition was to take place in 1912, when Carnegie's party landed off La Plata in Argentina, just east of Buenos Aires. (Holland recounted his experiences in *To the River Plate and Back*, which met with some success upon its publication in 1913.) After Madrid, things remained quiet for some time, due to the death of Andrew Carnegie in August of 1919 and, of course, the outbreak of the First World War. However, in 1932 Carnegie's widow Louise was persuaded to donate another copy of *Diplodocus* to the Mexico City *Museo de Historia Natural*, and two years later a final plaster cast was shipped off to the *Paläontologische Staatsammlung* in Munich, in exchange for a large collection of German fossils.  

The Exhibit

From the outset, sauropods had been portrayed as lumbering, none-too-bright, but surprisingly elephant-like creatures, with pillar-like legs that supported their huge bodies. Yet the first dinosaurs ever to be restored to what was considered a life-like posture had been based on entirely different role models. Benjamin Waterhouse Hawkins's (1807–94) sculpture of *Iguanodon*, which graced the Crystal Palace grounds from 1854 onwards, looked, as its name suggested, like an oversized and overfed iguana lizard. Its companion *Megalosaurus* had not been quite so overtly reptilian, but rather appeared to be permanently shrugging its shoulders. The remains on which these reconstructions had been based were fragmentary, and Richard Owen, Hawkins's supervisor, had simply extrapolated the biomechanics of contemporary animals.
For Waterhouse Hawkins, the problem of posture became an acute one when he was asked, in 1868, to erect the world's first mounted dinosaur skeleton in the Philadelphia Academy of Natural Sciences museum. Although the remains of this *Hadrosaurus foulkii* were by no means complete, the large difference in size between the animal's legs and arms did seem to indicate that it had been bipedal, and therefore not really comparable to his earlier work in London. Instead of sculpting its life image, as he had done earlier, Hawkins reconstructed the animal's skeleton. However, the absence of *Hadrosaurus*'s head caused Hawkins — again — to turn to an extrapolated iguana's skull instead.

Necessity forced Hawkins to invent much of his method as he went along, mainly because of the fragmentary nature of many of the fossils he had to work with. This changed rather dramatically in 1878, when miners discovered a herd of *Iguanodon* fossils in a coal mine near the southern Belgian town of Bernissart. Suddenly, instead of the usual jumble of fragments, scholars could pick from literally dozens of complete fossils. Many of the *Iguanodon*'s remains were found as complete, articulated skeletons. These close relatives of *Hadrosaurus* confirmed that previous lizard-like models had been incorrect and that these dinosaurs had adopted a posture in life that had few parallels in extant nature.

The chief excavator, Louis Dollo (1857–1931) faced the task of erecting these in a more or less life-like position in the Royal Belgian Institute of Natural Sciences in Brussels. Using an elaborate system of ropes, wooden beams and pulleys, the *Iguanodon* bones were hoisted up and then hammered into place with wedges. For all the innovation that it brought, the system adopted by Dollo did have its disadvantages. For one thing, it proved to be nearly impossible to disassemble the mounts without damaging them. It was also labour intensive. From the beginning it was clear that this method would not do for *Diplodocus*, but luckily Coggeshall had other examples to turn to, most of all the work done in the Department of Vertebrate Paleontology at the American Museum of Natural History. But even with these examples, Coggeshall had to develop an entirely new technique to facilitate his travelling dinosaur. He constructed a new skeleton made up of forged steel rods, in which the cast bones could be positioned. Not only was this much quicker to set up, the display could also easily be disassembled, adapted and reassembled.

The historian Paul Brinkman has unflatteringly characterized Holland as a director of the 'kick downstairs, lick upstairs' school: he was short-tempered and flippant towards his subordinates, and somewhat of a sycophant when dealing with his superiors. Like his New York counterpart Osborn, Holland belonged to a new generation of museum directors: administrators rather than field workers, scientific but also social 'animals'. Not surprisingly, then, Holland was all too eager to please his European hosts when it came to determining *Diplodocus*'s posture:
The authorities of the National museum in Paris finding that the space which they had at their command was very limited, requested me to give to the tail of the Diplodocus a considerable curvature, and I have conformed with their request. I feel that this modification detracts somewhat from the impression which the specimen produces in the mind of the observer and only adopted it in view of the exigencies of the case. Should it, however, be desirable for you to resort to a similar expedient for any reason whatever, I request you to notify me at once so that the necessary changes which will have to be made in the disposition of the caudal vertebrae can be immediately undertaken. 30

To some degree, Holland should be forgiven for his concessions, since he and Coggeshall had to work with local people, and had to make do with the spaces as they found them. Setting up a 26-metre-long dinosaur in sometimes quite small rooms turned out to be a daunting challenge. On the other hand, their cramped surroundings made the animals look even larger and contributed to the sense of awe that the public must have felt. And to Holland and Coggeshall there was nothing innately wrong in having the animals adopt a more imaginative stance, as we shall see.

While the technical part of the assembling went smoothly, communication sometimes caused problems. One such problem, the re-telling of which neither Holland nor later writers have been able to resist, occurred whilst assembling the St Petersburg Diplodocus, when, after the local labourers had accidentally dropped the rod holding the animal’s backbone and nearly killed Holland, he and Coggeshall spent weeks gluing the remains together. Here, as in Paris, the tail would be laid in a curve to make the cast fit inside the Imperial Museum’s hall. In Vienna, the same measure was taken, and in Argentina the neck had to be slightly curved to avoid hitting a balcony.

A Matter of Posture

Already before the official unveiling in 1905, some visitors of the British Museum had raised doubts about Diplodocus’s upright, mammal-like posture. However, it was an American scholar, Oliver Perry Hay (1846–1930), who in 1908 first voiced his criticism in publication. Hay suggested that the Diplodocus’s elephantine stance had more to owe to the reconstructor’s imagination than to reality. But with fame came importance. By this time Diplodocus had become a source of national pride to American scientists, and particularly to the employees of Carnegie’s Pittsburgh Museum (ironically, Hay also worked for one of Carnegie’s institutions). However, as more and more copies were distributed throughout the European peninsula, Diplodocus was increasingly being appropriated by the countries to which it had been donated – and not all Europeans were prepared to take the Americans at their word. Moreover, one cannot escape the impression that, like Lankester, many European scientists were divided between gratitude for the gift and some degree of condescension toward the parvenu from whom they had to accept it. German scientists, but certainly also French and British
ones, were not always ready to accept their transatlantic brethren as the donators rather than the receivers of scientific material – and opinion.31

Enter the German zoologist Gustav Tornier (1858–1938), whose unfortunate fate it has become to be chiefly remembered because of the ridicule heaped upon him by several generations of paleontologists as a consequence of his claims regarding the posture of Diplodocus. Yet Tornier was an experienced and able, if acerbic herpetologist and anatomist, who played an important role in the organization of science in the German capital in the last decades of the nineteenth century. Unlike Hay, whose attitude had been critical but constructive, Tornier’s tone was far less conciliatory. Here was a conflict of nationality and of clashing academic traditions. Tornier took issue with the anatomical inferences made by Hatcher and, following him, Holland. He produced a point by point comparative analysis of the animal, and arrived at the conclusion, as Hay had done, that it must have adopted a lizard-like posture, with its tail functioning as an ‘anchoring device’ to prevent the (aquatic) animal from floating away.32

However, what really caused offence was the accusation levelled at the Americans that they had in fact produced something that could not stand up to proper scientific examination. Tornier explicitly chastised Holland for letting opportunism get in the way of proper science when deciding on how the animal had been exhibited:

That the Diplodocus must have been able to raise his neck vertically, is something Mr. Holland already assumed ... The reason why the present position was chosen for the restoration was to make the skull and neck vertebrae more visible to the visitor.33

The problem was that, matters of prestige and respect apart, Tornier had a point when it came to scientific methodology. For all the rich harvests brought home by the intense rivalry between fossil hunters Marsh and Cope in the 1870s and 1880s, the emphasis in American palaeontology came to rest on taxonomy, or rather: describing as many new genera and species as possible, often on the basis of scant material. When Marsh described his restoration of Brontosaurus in 1883, hardly a word was spent explaining or justifying the choices made in reconstructing the animal.34 To everyone the exhibited posture appeared to be obvious choice, one regarded as suitably becoming to these enormous beasts – even if, as Osborn would admit, it was somewhat conjectural. This was an age in which size really began to matter, after all. Anyone browsing through contemporary copies of Scientific American and similar popular science magazines is constantly struck by the overwhelming abundance of size comparisons: buildings, motor vehicles and dinosaurs: there is always a quest for the gigantic, the overwhelming – and a wish for that overwhelming quality to be American. When accepting the London specimen, Sir Archibald Geikie had acknowledged as much when he paired the animal’s size with that of its donor’s nation.35
Compared to Marsh's work on the *Brontosaurus*, Hatcher's 1901 essay on the *Diplodocus*—the one containing the restoration drawing that started it all—was an exemplary effort. However, little of it was dedicated to describing the animal's stance and where it did it notes differences between it and mammals. Moreover, according to Hatcher the lack of articular surfaces suggested aquatic habits and continual support by water. Tornier therefore saw little but support for his own views in Hatcher's work. Holland's work, on the other hand, appeared to have been little more than guesswork, not something that could bear serious scrutiny.

The Berlin Museum of Zoology (part of the Naturkundemuseum; see Figure 12.2), where Tornier worked, was primarily a scientific institution, where little consideration was given to the way in which information was presented to the visitor. By contrast, Carnegie, and by extension Holland and Coggeshall, were far more concerned with the effect their display would have on the audience. Museums in the United States had made great strides in that respect: the Smithsonian's influential George Browne Goode (1851–96) was primarily concerned with the museum's role in educating the public. Holland's displays, and his justification for the adaptations he was prepared to carry through, show Goode's influence. Tornier, by contrast, would have considered anything seeming to pamper to the public as an affront to scientific integrity. As a consequence, he worked in a museum that Coggeshall described as 'one of the poorest and least interesting of any on the continent'. But making the displays 'interesting' was simply not something a scholar such as Tornier was interested in.

It was therefore a debate wrought with misunderstanding from the outset, and Holland had never been one to respond very gingerly to overt criticism. Furthermore, Tornier's article was imbued with a cynicism that hardly helped to soften the blow. Holland, who really had played a very minor role in deciding the *Diplodocus'*s posture (most of the scientific work, after all, had been done by Hatcher), now saw his work of the last five years, and more importantly his sense of self-esteem, undermined by foreign forces. His response to Tornier was in kind:

> It was a bold step for him immediately to transfer the creature from the order Dinosauria, and evidently with the skeleton of a *Varanus* or *Chameleon* before him, to proceed with the help of a pencil, the powerful tool of the closet-naturalist, to reconstruct the skeleton upon the study of which two generations of American paleontologists have expended considerable time an labor, and squeeze the animal into the form which his brilliantly illuminated imagination suggested.

With all their *ad hominems* and innuendos, these lines effectively carry across the personal indignation that Holland must have felt; Tornier concluded that 'it had all become properly messy'. Holland furthermore asserted that it was Tornier's reconstruction that stretched anatomical reality, not his own. It was impossible to fit the leg bones into their sockets in the way Tornier had suggested, and a giant lizard-like *Diplodocus* would have needed a gutter to move in because its ribcage was so deep.
Figure 12.2: *Diplodocus* exhibit in the central courtyard of the Berlin Natural History Museum, from *Der Tag*, 23 June 1908; reproduced from the author's personal collection.
However, Holland received some support from the European continent as well. From Paris, Marcellin Boule downplayed Tornier's argument by suggesting his inexperience compared to Holland's. Vienna's Othenio Abel also came down on Holland's side, and Frankfurt's Fritz Drevermann – after all, the proud owner of a real Diplodocus – could not resist chiming in. While Drevermann concurred with Tornier's conclusions about the animal's legs, he disagreed about the neck, which Tornier maintained was bent in an s-like curve. But Drevermann did take issue with Tornier's apparent lack of respect for his American colleagues: 'that they who, after all, mount dinosaurs by the dozen, would have no understanding of the reptilian skeleton, is highly unlikely.' While hereafter Tornier apparently decided not to pursue the case further with his American counterparts in the professional press, it continued to fuel popular debate.

In Germany, a 'Tornierian' school of thought about the posture of dinosaurs was taking shape. Writing in a new handbook on science, Tornier not only reproduced his own revision of the Diplodocus, but also condemned other dinosaurs (an Iguanodon and a fictional 'Agathaumas') to lizard-like locomotion, usually adapting older, American illustrations (see Figure 12.3). And when the front of the newly-built Berlin aquarium was covered with dinosaurian murals in 1913, these were also decidedly Tornierian in outlook. Both these drawings and the murals were made by the well-known illustrator Heinrich Harder, whose other depictions of dinosaurs show them crawling about rather than striding majestically in the way envisaged by Holland. The German Kaiser, Wilhelm II, who had so far shown little interest in the animal when it was first erected, was even led around the Berlin museum by Tornier, and told how its Diplodocus might be repositioned in a more 'German' fashion. In the end, however, work on the museum's recent, and even more colossal, dinosaurs from German East Africa prevented realization of these plans.

The situation evolved rather differently in the case of Germany's other Diplodocus, Jesup's gift to Frankfurt. As we saw, the Senckenberg Museum's Diplodocus longus had been removed from its wooden boxes in 1920 and, with some creativity on the part of preparators and the addition of a fair few other sauropod bones (mostly Camarasaurus), turned into a fully three-dimensional mount. Initially, the animal had been constructed much like Holland's dinosaurs, albeit with a much more vertical scapula (shoulder blade). However, when Strunz re-mounted the animal in 1936, he left it in a semi-reptilian state. 'The only real skeleton' as the recently-renamed museum magazine Natur und Volk called it, was an object of prestige, and the year after the national socialists had come to power was perhaps not the ideal time to shun a specifically German approach to mounting the animal. And while models made for the mount show Strunz's preference for a lizard-like setup (after all, his erstwhile director Drevermann had spoken out in favour of Tornier), it would probably have brought him into conflict with peers. Instead, Strunz chose to show the animal on its hind legs, reaching for the water surface.

(the animals had supposedly been aquatic). This was a clever way to avoid an all-too-explicit choice with regard to either a reptile-like or a mammal-like posture.

**Big Science Meets Big Politics**

Carnegie’s main agenda in the early twentieth century was the promotion of world peace, and the donation of the *Diplodocus* casts should be regarded in this light. Apart from fulfilling his need for personal recognition – which certainly played a role – Carnegie perceived that the best way of achieving his ambitions was to exert influence personally on the ‘crowned heads of Europe’. Plying them with impressive artefacts, and so allowing them to curry favour with the public on their respective domestic fronts, was one of the means in that campaign. But there are other factors at play, too. One was the enlightenment of the people, which had long been an object of Carnegie’s philanthropy. Like the libraries and educational institutions he financed, *Diplodocus* came to offer the public insight into contemporary science of the kind Carnegie could identify with himself.
A final element that needs pointing out is one that has already been studied more deeply by Paul Semonin, and concerns the identification of dinosaurs with dominance. Semonin argues that commentators, inspired by social Darwinist ideas, typically use the language of empire and autocratic rule to describe the dominance of these animals over the rest of the natural world. Press coverage of the London and Paris unveilings used similar language: 'A mighty Gift', 'Colossal stranger', 'The greatest of reptiles'. In a way, Carnegie was Diplodocus: the mighty man, risen from paupers in order to dominate the world around him, just as the dinosaur reigned over the temples of culture in which Carnegie had put him. The similarity between the present and its donator was certainly not lost on contemporaries.

However, this could also be a problem, and in the end the Diplodocus campaign cannot be said to have been an unequivocal success from Carnegie's point of view. First of all, where he had intended for his gift to convey his generosity and allow his royal 'friends' to offer it to their respective peoples with dignity, all too often press reports reflected the farcical side of the proceedings. The 'Crowned Heads' were often confronted with scorn and ridicule (albeit veiled) as much as with the open-mouthed adoration they had been expecting. As the campaign went on, the monarchs' eagerness to receive a dinosaur copy, and Carnegie's avidity to humour them, threatened to make a caricature of the donations. The heads of increasingly less important states were seen to bow to the American parvenu in order to receive their own little toy; and Carnegie would play the part of the archetypical American millionaire, whose relevance rested on nothing other than his tremendous wealth. That the casts proved to be a source of heated debate between American and European scientific communities was particularly unfortunate in light of Carnegie's intention that they help strengthen international harmony. The Tornier controversy, in particular, shows how many European scientists were not quite ready to accept a flow of ideas coming from the other side of the Atlantic, even in palaeontology. Their American counterparts proved equally resistant to what they considered as arrogant conjecture about specimens the Europeans knew nothing about.

As an exhibit, then, the casts were not without risk, with the multiple forms of Diplodocus display exemplifying not only the determining impact of locality upon scientific knowledge, but the way the meanings of popular exhibits could be a complex product of political interactions between donors, curators, institution and changing display technologies. Moreover, it was equally difficult to control the public impression left behind by something that was such a vessel of extremes. Diplodocus proved to be without equal as a museum exhibit. By 1914, Carnegie's gifts had created a situation in which one could find a diplodocus in his own home of Pittsburgh, and virtually every major capital on the European continent. For millions of people, it was the first 'real' dinosaur they had seen.
In a world that was not, like ours, so saturated with images of these animals, its effect was far-reaching. From 1905 onwards, we see Diplodocus become a part of popular culture, a synonym for dinosaurs or even extinct animals in general; but also a metaphor for all that it was thought to represent. Writers such as James Joyce, John Kendrick Bangs, Bram Stoker, Stephen Leacock and a whole slew of sensationalist adventure writers (including, of course, Edgar Rice Burroughs) used the Diplodocus as a reference, as an anchor to portray characteristics such as strength, size, sloth, plodding slowness and stupidity. In Stoker’s *The Lair of the White Worm* (1911), when Adam and Sir Nathaniel are discussing ways of murdering Lady Arabella, she is declared to be an ‘antideluvian monster’ who has ‘the strength and impregnability of a diplodocus’. Similarly, in *The Autobiography of Methusalah* (1909), by the American comic writer John Kendrick Bangs, in a passage debating whether personal antics of a rich and famous couple should be reported in the press, the narrator declares that ‘if she chooses to go joy-riding on a Diplodocus with a gentleman from the Circus, it is Zebulon Zebedee’s business, not mine’. It seems that the association between Diplodocus and popular spectacle was too good an opportunity for Bangs to ignore. One of the first animation pictures, Winsor McKay’s *Gertie the Dinosaur* (1914), featured a diplodocus. Significantly, the film’s main character was called ‘the Dinosaurus’ – indeed, for many people, particularly in Europe, Diplodocus was *the* dinosaur.
63. Ibid.
64. Dawson, 'Pettigrew's Demonstrations upon Mummies', p. 178.
65. Ibid.
66. Ibid.
67. Daly, Modernism, Romance and the Fin de Siècle, p. 87.
68. Ibid., p. 175. One example of a three-hour unwrapping occurred on Friday 22 May 1836 in the lecture theatre of the Royal Institution. Pettigrew delivered a lecture on embalming before then proceeding to unwrap the mummy and encountering a large amount of bandages which proved very time-consuming.
69. Daly, Modernism, p. 99.
71. Poe, 'Some Words with a Mummy', p. 106.
73. An example of a piece of linen from an unwrapping held at Lordship Lane Hall can be found in the collection of the Egypt Centre, Swansea (accession number EC951).
74. Edwards, A Thousand Miles up the Nile, p. 414.
76. Pringle, The Mummy Congress, p. 188.
78. In 1857 an unwrapping at the Universal Exposition in Paris featured a mummy where gold jewellery was unveiled.
81. Ibid., p. 172.
82. 'Unrolling of a Mummy', The Times, 19 December 1889, p. 11.
83. Ibid.
84. 'Unrolling of a Mummy', New York Times, 12 January 1890, p. 4. See also The Times (1889), p. 4.
85. Letter written by J. M.S. Brooke to The Times, 19 December 1889, p. 11

12 Nieuwland, "The Wandering Friend"

2. Ibid., p. 8.

7. See, for instance, R. Derby Holmes, *A Yankee in the Trenches* (Boston, MA: Little, Brown & Co., 1918). Holmes seems unaware of the meaning of the word 'Diplodocus' but reports that it is used by his fellow soldiers.

8. Thus started a tendency in American journalism to consistently exaggerate dinosaurian proportions.

9. For an excellent and detailed account of this episode, see Rea, *The Bone Wars*, pp. 29–51.


20. Most of these were 'spares' from the AMNH's expeditions to Wyoming in the 1890s.

21. It needs to be said that neither institution topped the charts in terms of visitors. However, that was not necessarily their primary aim. For instance, despite trailing it by about one quarter in the number of visitors (90,000 to 125,000) in 1910, in scientific terms the Berlin museum was deemed a far more important institution than the Hamburg natural history museum.


25. This copy survived the devastations of the Second World War, but it was never mounted.
26. For this reason, the Brussels *Iguanodon* still stand as Dollo's men erected them, and need to be climate-controlled because of the bones' treatment. However, after one hundred and thirty years, the mounts themselves can be said to be museum objects illustrating an important step in the display of fossil animals.
33. Ibid., p. 206 (my translation).
38. In the past, Holland's belligerence had alienated more than one of his collaborators, most importantly *Diplodocus* co-discoverer Jacob Wortman. See Brinkman, *The Second American Jurassic Dinosaur Rush, 1895–1900*, and Rea, *The Bone Wars*.
39. See Tornier, 'Wie War Der Diplodocus Carnegii Wirklich Gebaut?', and G. Tornier, 'Ernstes Und Lustiges Aus Kritiken Uber Meine Diplodocusarbeit / War Der Diplodocus Elefantenfussig?', *Sitzungsberichte der Gesellschaft Naturforschender Freunde zu Berlin*, 9 (1909), pp. 505–56. Those expecting a dry Teutonic reposed will be surprised: Tornier's writings are eloquent, sharp and sometimes outright funny — but it must have been the more infuriating because of it.
42. 'Und daB die, welche doch die Dinosaurier – ich möchte sagen – dutzendsweise montieren, so gar keine Kenntnis vom Reptilienskelett haben sollten, ist doch höchst unwahrscheinlich.' Drevermann as cited in Tornier, 'Ernstes Und Lustiges Aus Kritiken
Über Meine Diplodocusarbeit / War Der Diplodocus Elefantenfüssig?, pp. 505–56, on p. 507 (my translation). Drevermann goes on to state in another publication that 'Many models and images of extinct animals are documents of a lively imagination rather than serious scientific labour'. F. Drevermann, 'Der Diplodocus', Berichte der Senckenbergische Naturforschungsgesellschaft, 42 (1911), pp. 272–82, on p. 276.

43. Recently, Tornier has received some posthumous vindication. New studies into sauropod behaviour suggest that they held their head high above their bodies rather than in front, just above ground level. See 'War of the Sauropods', New Scientist, 202:2710 (2009), p. 5.

44. Tornier, 'Reptilia: Paläontologie', Handwörterbuch Der Naturwissenschaften. 8. Band, Quartärformation – Sekretion (Jena: Gustav Fischer, 1913). For example, the article contains a 'Tornierised' Agathaumas, originally painted by the well-known American artist Charles Knight in 1898.


48. Witness the press reports to the donations to the Russian Czar, the Austro-Hungarian emperor and particularly the Italian king.
