

Feature



The Victorian Geological Illustrations of Crystal Palace Park, London: cycles of conservation and neglect, 1993–2023

In 2023, two decades after the restoration of the Victorian Geological Illustrations by the London Borough of Bromley—and the visit of the late HRH Prince Phillip to mark the completion of the restorations—it is clear that these internationally significant sculptures are in a worse state than ever before. Although interest in them remains high, and in spite of the best efforts of the Friends of the Crystal Palace Dinosaurs to protect and interpret them, it is plain that they are greatly at risk. In the year that marks the two-hundredth anniversary of the description of *Megalosaurus*, depicted in all its magnificence in the park, it is a matter of urgency that we promote the significance of a site that really should be recognized for what it is—world heritage—and its current state of neglect.

The ‘Geological Illustrations’ of Crystal Palace Park, magnificent examples of Victorian ingenuity and solid representations of science in action, are under threat. Set in a public park Crystal Palace Park in south-east London, the public routinely passes by what seems to be an anachronistic set of life-size prehistoric sculptures set in a woodland glade adjacent to a lake.

Understanding why they are here, and what they represent, has been a passion of mine since I happened upon them in the early 1990s. Then, the local council authorities took a municipal view of the site, sending out painters with paintbrushes (Fig. 1) and industrial paints when needed to touch up the sculptures, and park grounds people to trim bushes, weed where necessary, and plant jolly (but incongruous) daffodil bulbs and other plants that would be at odds with the stratigraphical setting of the site. They looked after the ‘illustrations’ as best they could, with a paternalistic view. Now, with costs rising, reduction in council budgets, and other pressures of the first quarter of the twenty-first century, this site is in grave danger. In my view, and that of other interested parties, this place is ‘world heritage’, arguably as important as any other

piece of real estate relevant to the history of science or technology in the United Kingdom, such as Ironbridge Gorge, Pontcysyllte Aqueduct, Jodrell Bank in Cheshire or the Cornish and Devon Mining landscape all of which are designated as World Heritage Sites on the UNESCO list. It behoves us, for future generations, to protect such sites, as it was at these very places that we can see the birth of ideas, and the representation of them in physical form.

The ‘Geological Illustrations’

In June 1854, Crystal Palace Park was opened to the public for the first time. Its designer, Sir Joseph Paxton, intended it as a complex of pleasure grounds to rival those of the Palace of Versailles, housing the reconstructed Crystal Palace the innovative glass and steel structure built by Paxton for the Great Exhibition of 1851 in Hyde Park in central London. The Palace itself was built on the crest of Sydenham Hill, then a distant suburb of the capital, and a series of terraces were constructed on its slopes, including immense fountains and a large boating lake.

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Paxton's vision was a complex one. A central grand walkway was the axis of the park, bisecting formal Italianate gardens of the top terrace, and large twin fountains and finally the English Landscape Garden at the base of the slope. Within this garden and associated with the lakes, manifestations of geology were to be constructed, 'Geological Illustrations' of a former world, and there they remain today long after the Palace itself was lost a unique component of this extraordinary public park.

As described in a number of publications since the early 1990s, Crystal Palace Park's Geological Illustrations represent arguably the world's first attempt at recreating, in a systematic, scientific and ordered way the geology of the UK, and though under serious threat from neglect today, its survival and subsequent restoration in 2001 is a remarkable testimony to its constructors and originators.

Paxton's landscape was to include a representation of the successive ages of the geology of Britain from the Primary (Precambrian and Palaeozoic) rocks through to the Secondary (Mesozoic) and Tertiary (Tertiary–Quaternary today). This vision of the geology of Britain was to include economic rocks and geological structures, together with the remains of relatively newly discovered fossil organisms constructed in a full-size and three-dimensional form (Fig. 2).

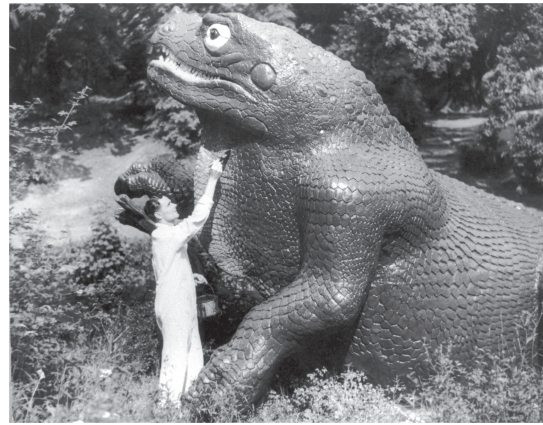
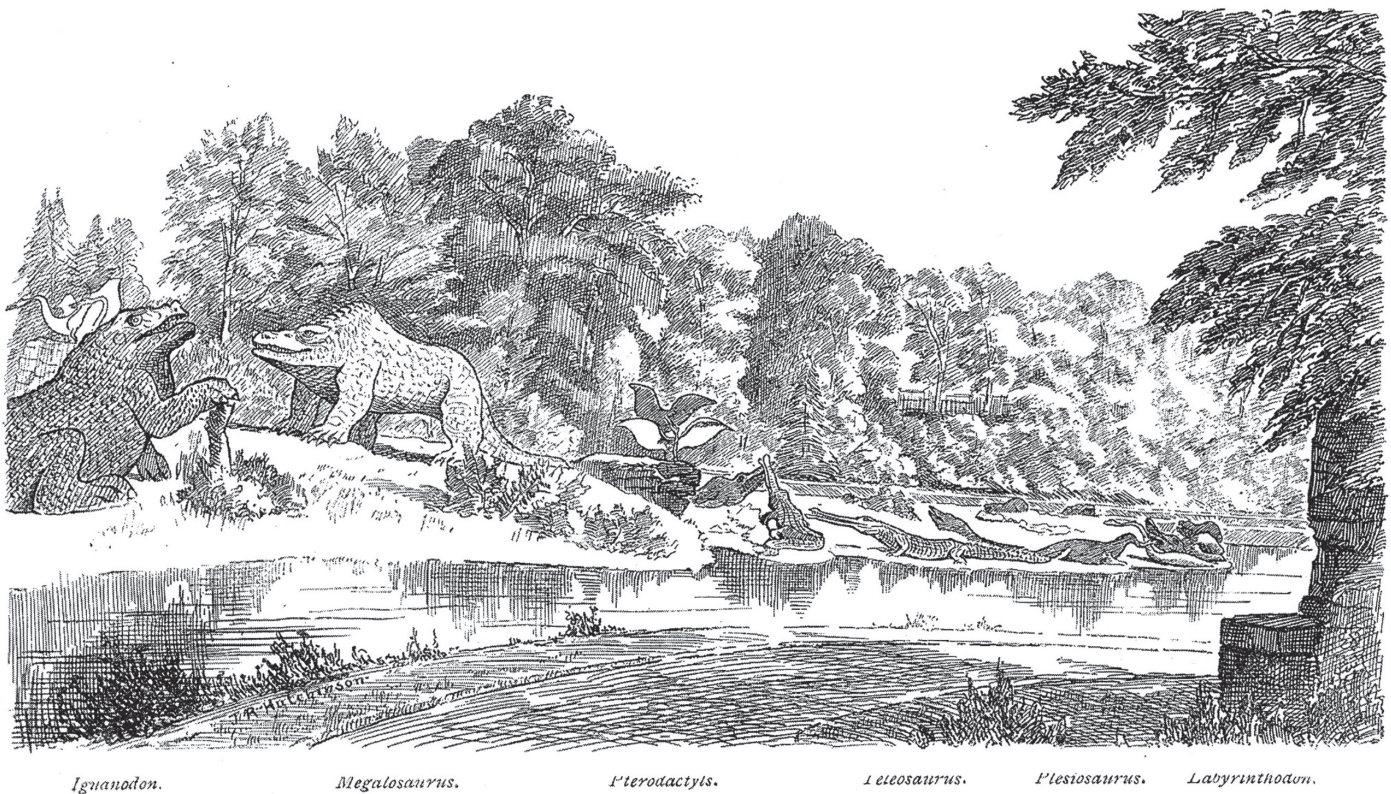


Fig. 1. Council workmen give a Crystal Palace *Iguanodon* a lick of paint in the 1950s, evidence of a paternalistic approach to municipal conservation (Image: Mick Gilbert/Morton Partnership/LB of Bromley).

The task of constructing these was the duty and vision of sculptor Benjamin Waterhouse Hawkins, who had experience in illustrating the published work and treatises of some of the leading palaeontologists of the day. As 'Director of the Fossil Department of the Crystal Palace', Hawkins, advised by Sir Richard Owen (though the extent to which he actually engaged in the work is currently disputed), constructed his full-sized extinct mammals and reptiles arranged stratigraphically in a geological landscape based on the ideas of Professor David Thomas Ansted, late Professor of Geology at King's College, London, and subsequently at the

Fig. 2. The Geological Illustrations: the 'Secondary Island' as depicted in the late nineteenth century (From Hutchinson's *Extinct Monsters*, 1893).



Iguanodon.

Megalosaurus.

Pterodactyls.

Melosaurus.

Plesiosaurus.

Labyrinthodon.

FIG. 52.—Mr. Waterhouse Hawkins's Models of Extinct Animals in the grounds of the Crystal Palace, Sydenham.
From a sketch by J. R. Hutchinson (by permission).



Fig. 3. The changing fortunes of the 'Geological Illustrations'. **a.** the 'Mountain Limestone' Cliff reconstructed in 2001–2003 after being destroyed in the early 1960s; the stone was sourced from Derbyshire, as it had been by James Campbell in the 1850s. Behind the gate is the 'cave', actually a representation of a mineral mine, with mineral specimens, stalactites and stalagmites. **b.** the Mountain Limestone Cliff in 2023; unloved, overgrown, and shielded from sight by a line of council-planted trees. **c.** the 'Coal Measures', a clever recreation of the measures of Clay Cross, Derbyshire, photographed after my request to Bromley Council that they treat the weeds and cut back growth in the mid-1990s. **d.** the 'Coal Measures' in 2023, shamelessly left to degrade, and placing it in a parlous state. (Images: P. Doyle).

College of Civil Engineers at Putney, and constructed in place by James Campbell, who obtained the stones to do so. It was a vivid recreation of the most recent discoveries in a new and exciting science.

Cast in a physical form in a public park, the geology and reconstructed life-size organisms have been mute witness to both the development of London and the advance of time. They have suffered over

the years, through the declining fortunes of Paxton's Victorian pleasure grounds and economic decline, the impact of the world wars, and the pressures of today. They remain as precious survivors. All through this the dinosaurs have glowered from their island home and have suffered the indignity of being described as 'wrong' or 'incorrect', as science has advanced. They are neither of these, instead representing the cutting edge of geology in 1854. That they remain intact, a point of pilgrimage for all interested in the history of science is a cause for celebration. But there are signs of recent neglect that we should all be concerned about, a threat to the very fabric of this heritage.

Decades of concern

It seems that, over the last 30 years, concerns over the conservation status of the Crystal Palace Geological Illustrations have been decadal; 'booms' of conservation punctuated by 'busts' of neglect.

In 1993 my personal involvement commenced through a visit that opened my eyes to the magnificence of the Illustrations as the whole scene was referred to in all the contemporary guidebooks in linking reconstructed geological 'outcrops' to fossil reptiles and mammals. Here was a physical geological map, a means of showing not only the animals themselves in life-like poses, but also the very rocks or a close approximation of them that would have contained their physical remains. There was a lesson in stratigraphy, replete with rocks, fossils and reconstructed animals in realistic settings, for all who could interpret them; this led to my paper, co-authored with Eric Robinson, in 1993, and a number of other accounts. In this work, I set out visible 'stratigraphy' as it confronted the observer, giving a 'geological map' that has been accepted and used by subsequent authors. It was fortunate indeed that, Steve McCarthy and Mick Gilbert published their valuable book *The Crystal Palace Dinosaurs* around the same time in 1994, documenting the sculptures and their history, such that the London Borough of Bromley were starting to take note of the growing interest in the site and of its wider significance. This led to a successful bid by the council to gather funds to carry out an ambitious restoration of the site, a £3.6 million programme supported by the Heritage Lottery fund and the Crystal Palace partnership. The restoration programme was carried out by the Morton Partnership, skilled in historic conservation work, and I acted in the capacity of consultant and advisor, my time given in kind to the borough by my then employer, The University of Greenwich.

The restorations were completed in 2002–2003, 10 years after my initial involvement and that of McCarthy and Gilbert. Here, for the first time since they had been constructed some 150 years before, the public was able to see the Geological Illustrations as they were meant to be seen. Geological features that had been destroyed when the park was transformed into a national centre for sports created from the former fountain bowls in the 1960s were restored, and in particular the 'Mountain [Carboniferous] limestone' cliff, recreated at its original site with stone sourced from Derbyshire (Fig. 3). This gave renewed significance to the 'cave' with 'mineral veins', 'stalactites and stalagmites' and other recreated elements of this county's geological beneficence. The Coal Measures cliff, based on the Carboniferous succession of Clay Cross again in Derbyshire was cleared of vegetation, stabilized and restored, such that its relationship with the 'older' limestone strata was clearer. Not only that, the stratigraphical backdrops of the Mesozoic animals were also restored or recreated, with Lias (Lower Jurassic), Oolite (Middle Jurassic), Wealden (Lower Cretaceous) and Chalk (Upper Cretaceous) receiving attention.

Taking centre stage were the animals, which were cleaned and restored, cracks and fissures stabilized,



Fig. 4. The 'Secondary Island', with Permo-Triassic labyrinthodons in the foreground, Liassic marine reptiles behind, beyond which would have been Oolite (Middle Jurassic) pterodactyls, and then the dinosaurs on the main island. As can be seen from these images, the last 20 years have brought neglect. **a.** image from c. 1993 showing municipal paint jobs and some worrying cracking in the labyrinthodons, ichthyosaurs and plesiosaurs, but evidence of vegetation clearance. **b.** image from the early 2000s, post-restoration, showing the muted colour tones, repaired cracks, and restored features, including the Jurassic pterodactyls (subsequently lost to vandalism or high winds). **c.** The scene in 2023. Horribly overgrown, vegetation is now growing through the body of at least one of the ichthyosaurs (Images: P. Doyle).

and missing elements restored to them, before being repainted with more muted tones, thought to be in keeping with Victorian aesthetics (Fig. 4). And where the animals had disappeared altogether, such as the Middle Lias pterodactyls, they were replaced with replicas based on contemporary illustrations and photographs. With the restorations complete, and the high-profile events over, the site was left to itself, with hopes that the now magnificent illustrations would survive intact for years to come.

But, sadly, it was not to be. Another decade on, and another group of concerned citizens and scientists took on the baton of protection. Established in 2013, the Friends of the Crystal Palace Dinosaurs was formed, to counter some of the worst effects of time and neglect, with a mission to 'improve the conservation and interpretation of the sculptures, geological illustrations and site in Crystal Palace Park'. In the intervening years, the site had once more



Fig. 5. The changing fortunes of the ground sloth *Megatherium*. **a.** Painted in 'battleship grey', dynamically claspng its tree in search of foliage, c.1993. **b.** As restored in c.2003, visible from the footpath. **c.** Now completely obscured from view; a small patch of the animal's long fur can just about be seen (Images: P. Doyle).

become severely degraded, with many of its features, sculptures and geology alike threatened by neglect and natural processes. With gusto, the Friends set to work to improve access, to guide and advise, and to add their weight to the further interpretation of the site. They were instrumental in getting the Geological Illustrations recognized as being at risk, with English Heritage (now Historic England) designating the site as 'vulnerable' and 'declining' in condition. This was mitigated by a further injection of cash in 2014, £400 000 for 'infrastructure, interpretation and conservation', leading to conservation work in 2016 carried out on particularly vulnerable sculptures, such as the standing *Iguanodon*, and the marine reptiles. The work of the Friends continues today, with the publication of a book authored by two prominent members, Mark Witton and Ellinor Michel, whose *Art and Science of the Crystal Palace Dinosaurs* in 2022 has much to commend it, with new information and insight. Without the Friends of the Crystal Palace Dinosaurs, there is little doubt that things would have been much worse.

Entering a fourth decade of concern in 2023, I was shocked to revisit the site and see with my own eyes the level of neglect that the custodians of the Park had allowed to develop over the 20 years since my direct involvement. I can see the uphill struggle that the Friends of the Crystal Palace Dinosaurs have had to endure since 2013. Where once the site was pristine, clear and coherent, now the site was overgrown,

dangerously, and probably needlessly. Weeds and pervasive growth are everywhere some of it growing through the sculptures. Some of the most iconic and well-preserved of the 'prehistoric' mammals are completely obscured. The gigantic Plio-Pleistocene ground sloth *Megatherium*, for instance, simply cannot be seen for growth—which considering its bulk, is ridiculous (Fig. 5). It seems that routine clearance is not carried out, and transference of the responsibility for maintenance of the Park from Bromley Council to a third party has not helped in the slightest. One might expect that appropriately guided volunteer labour could assist, but this does not appear to be the case. In addition to neglect, there are other, less explainable characteristics of the site's management. In front of the 'Mountain Limestone' cliff, close to the fence and obscuring the feature altogether, it seems that trees were planted in a row not easily explained by self-seeding (Fig. 3). What is abundantly clear is that English Heritage's designation of the site as 'vulnerable' and 'declining' will not be improved by such neglect. The Geological Illustrations are in a parlous state.

The future

In 2024, some 200 years after the first description by William Buckland of the great 'fossil lizard' of the Stonesfield Slate, *Megalosaurus* (Fig. 6), and 170 years after the 'Geological Illustrations' had been opened to



the public as the first full-sized reconstructions of fossil life in the world, stratigraphically arranged, the future of Crystal Palace Park is teetering on the brink. It is to be hoped that the custodians of the site come to their senses soon, that they listen to the concerns of Historic England, of the Friends of the Crystal Palace Dinosaurs, and of historians of science, geoscientists and aficionados of Victorian ingenuity soon. This site needs constant care, growth needs to be cut back, regular attention should be given to clearance, and assessments can be made of the state of the site and its precious tableaux of extinct animals and geology, of cutting-edge science, 1854 style. If this can be achieved, then others can support them in the interpretation and promotion of what is truly a unique site of pilgrimage. For here, barely a decade after the recognition of the concept of the Dinosaur by its author Richard Owen was the realization of the true scale and bulk of these beasts through the talents and skills of its sculptor, Benjamin Waterhouse Hawkins, and his creations in a suburban park in south London. It really is unique, and it really needs to be cherished, rightfully, for what it is world heritage.

Websites

Friends of the Crystal Palace Dinosaurs. <https://cpdinosaurs.org/>
 UNESCO World Heritage sites in the UK. <https://whc.unesco.org/en/statesparties/gb>

Suggestions for further reading

Anon 1893. *Illustrated Guide to the Palace and the Park*. Charles Dickens & Evans, London.
 Buckland, W. 1824. Notice on the Megaloceras or the great fossil lizard of Stonesfield. *Transactions of the Geological Society of London (Second Series)*, v.4, pp.1–46.

Doyle, P. 1993. The lessons of Crystal Palace. *Geology Today*, v.9, pp.107–109.
 Doyle, P. 1994. *The Geological Time Trail*. London Borough of Bromley.
 Doyle, P. 2001a. Restoring a Victorian vision of 'deep time'. *Earth Heritage*, v.16, pp.16–18.
 Doyle, P. 2001b. Restoring a Victorian vision of 'deep time': the geological illustrations of Crystal Palace Park. *American Paleontologist*, v.9, pp.2–4.
 Doyle, P. 2008. A vision of 'deep time': the 'Geological illustrations' of Crystal Palace Park, London. In: Burek, C.V. & Prosser, C.D. (eds). *The History of Geoconservation*, Vol. 300. Geological Society Special Publication, pp. 197–205.
 Doyle, P. 2010. Itinerary 8: The 'Geological Illustrations' of Crystal Palace Park. In: Clements, D. (ed). *The Geology of London*. Geologists' Association Field Guide 68, Geologists' Association, London.
 Doyle, P. & Robinson, E. 1993. The Victorian 'Geological Illustrations' of Crystal Palace Park. *Proceedings of the Geologists' Association*, v.104, pp.181–194.
 Doyle, P. & Robinson, E. 1995. Report of a field trip to Crystal Palace Park and West Norwood Cemetery, 11 December 1993. *Proceedings of the Geologists' Association*, v.106, pp.71–78.
 Hawkins, B.W. 1854. On visual education as applied to geology. *Journal of the Society of Arts*, v.2, pp.444–449.
 McCarthy, S. & Gilbert, M. 1994. *The Crystal Palace Dinosaurs*. Crystal Palace Foundation, London.
 Owen, R. 1854. *Geology and Inhabitants of the Ancient World*. Crystal Palace Library and Bradbury & Adams, London.
 Phillips, S. 1855. *Guide to the Crystal Palace and Park*. Bradbury & Adams, London.
 Wilton, M. & Michel, E. 2022. *The Art and Science of the Crystal Palace Dinosaurs*. Crowood Press, Malborough.

Fig. 6. *Megalosaurus*, as depicted in 1854, just 30 years after it had been discovered; this discovery is 200 years old this year. **a.** Depicted in 1993, and in 2023, starting to disappear in the undergrowth, **b.** (Images: P. Doyle).