

# Iguanodon and Megalosaurus

## Two Victorian-era dinosaur models in the Tiegs Museum

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The Tiegs Museum at the University of Melbourne, as well as being an important zoology teaching resource for new generations of students, also serves as a tangible link to the scientific traditions of the 19th and 20th centuries. The collection includes many items from those times, such as spirit-preserved animals housed in elegant handmade jars, animal taxidermy from all over the world, and plaster casts of fossils. The Victorian era, in particular, was an exciting and revolutionary time for the life sciences, and the University of Melbourne, although geographically removed from much of the action, was very much a part of these developments.

One of the many innovations of Victorian-era scientists was the recognition and initial description of dinosaurs. Legendary British biologist Sir Richard Owen (1804–1892) coined this term in 1842—a remarkably insightful move given that he was basing this higher-level grouping on only three species, identified from incomplete specimens—and the study of dinosaurs as a real group of animals began.

Dinosaurs were of great interest to the scientific establishment, and the idea of giant, extinct reptiles excited the public's imagination

as well. One manifestation of the Victorian mania for dinosaurs was the construction, in the early 1850s, of 15 life-sized models of dinosaurs and other prehistoric animals in Crystal Palace Park, London. The park was created in 1854 as a new home for the Crystal Palace, an enormous cast-iron and glass building constructed as the display space for the 1851 Great Exhibition held in Hyde Park. Although the Crystal Palace itself was destroyed by fire in 1936, the dinosaur sculptures are still present in the park today.

The sculptures were designed by Benjamin Waterhouse Hawkins (1807–1894), a sculptor and illustrator who had studied natural history and geology. He worked under the direction of Owen to create scientifically accurate, lifelike models that were then displayed in a naturalistic, outdoor setting. These were the first models of dinosaurs ever made. Hawkins was aware that fossil bones were difficult to imagine as real animals and were potentially 'little more than objects of wonder',<sup>1</sup> even to those with a knowledge of science. He wanted his sculptures to make dinosaurs seem to come alive, for scientist and layperson alike.

From the outset, Hawkins and his supporters saw his sculptures as being primarily educational and accessible

to everyone—not just the educated elite. Hawkins thought of his dinosaurs as 'one vast and combined experiment of visual education'. The sculptures were envisioned not as mere spectacle, but as a public educational resource to improve the mind, for all classes of Victorian society. The dean of Hereford, Richard Dawes, a cleric and educator, suggested to Hawkins that small-scale models of the dinosaurs be made for the purpose of scientific studies in schools and other educational institutions. In the spirit of inclusiveness, Dawes said that:

He should be glad to see those models multiplied at a price which would enable them to be introduced into village and ordinary school, as every one could not visit the Crystal Palace, and he therefore hoped that specimens like those before them might be rendered attainable by those in remote and secluded districts, who would not have the advantage of witnessing the splendid and gigantic illustration of the extinct creation of the early ages of the world which would be there exhibited.<sup>2</sup>

Knowing a good merchandising deal when he saw it, mineralogist James Tennant struck an agreement

Benjamin Waterhouse Hawkins,  
Small-scale model of Iguanodon, c. 1855,  
plaster and paint, 34.1 × 47.1 × 18.2 cm. 1509,  
gift of Professor Georgina Sweet c. 1916–21,  
Tiegs Museum, University of Melbourne.



Benjamin Waterhouse Hawkins, Small-scale model of *Megalosaurus*, c. 1855, plaster and paint, 30.3 × 53.9 × 20.0 cm. 1508, gift of Associate Professor Georgina Sweet c. 1916–21, Tiegs Museum, University of Melbourne.

with Hawkins to produce the models, along with a series of six posters depicting the prehistoric animals that had been sculpted. Tennant, capitalising on the lucrative market of well-to-do gentlemen naturalists, had built up a successful business selling fossils, shells and minerals, and the tools needed to collect them.<sup>3</sup> Small-scale models were made of the dinosaurs *Megalosaurus* and *Iguanodon*, the aquatic reptiles *Ichthyosaurus* and *Plesiosaurus* (combined as a tableau), the flying reptile *Pterodactylus*, and *Labyrinthodon*, a giant amphibian described by Owen in 1841 from a number of different fossil specimens found in Germany and England.

In addition to these models, replicas were made by Henry A. Ward, an American professor of natural science and dealer in fossils, bones and other scientific specimens. Ward was advertising the models from at least 1866 and sold them from his business, Ward's Natural Science Establishment, in Rochester, New York. According to Ward's catalogue of the time, a full set of the five models could be purchased for \$30, or individually from \$5 to \$10.<sup>4</sup>

We have two of these small-scale dinosaur models in the Tiegs Museum: an *Iguanodon* and a *Megalosaurus*. As with much of



our collection, we have minimal information on these objects' history. There is one primary source: the museum's original register—a grand, hardcover notebook with marbled edges and entries written in ink copperplate—containing records beginning in the 1880s. About these models, the register records a few significant details. The entries indicate that the models were donated to the collection by Associate Professor Georgina Sweet, sometime between 1916 and 1921.<sup>5</sup> Sweet (1875–1946) was an accomplished and well-respected scientist at the university, commanding a wide knowledge of zoology and geology, eventually becoming recognised as Australia's foremost parasitologist and being awarded the OBE in 1935.<sup>6</sup> She contributed many items

to the collection and is memorialised by a cabinet displaying some of her specimens outside the museum's entrance.

In order to ascertain whether our models are Hawkins' originals or Ward's copies, I wrote to Professor Jane P. Davidson, an expert on the history of palaeontological illustration at the University of Nevada, and Dr Ted Daeschler, a palaeontologist at the Academy of Natural Sciences in Philadelphia. These two scholars kindly provided me with details and images of Ward's models, which, although very similar to ours, have distinct differences. The models in our collection are painted a glossy black, while the exposed plaster underside is a mottled white, grey and green. The Ward models are not black but a coppery-brown colour, with a bright-

green plaster underside. I could not be sure if our models retained their original paint until I saw first-hand an Iguanodon model in the collections of Melbourne Museum that is identical to ours in its details and colouration. Due to these differences in colouration and Melbourne Museum's closer historical association with the British rather than American scientific community, I am sure that its, and our, models are Hawkins' originals, rather than Ward's copies.

The following remarks on the models are entered in the Tiegs Museum register: 'Cast—scale 1 inch to the foot, Waterhouse-Hawkin's [*sic*] Restorations (Later Restorations indicate upright posture)'. The latter comment refers to Iguanodon's pachyderm-like morphology in Hawkins' restorations. When the first Iguanodon specimen was discovered by obstetrician and early palaeontologist Gideon Mantell in 1822, it comprised a jumble of vertebrae, limb bones and teeth. Mantell and Owen correctly deduced that Iguanodon must have been a gigantic, herbivorous reptile (an unprecedented concept at the time), but incorrectly reconstructed the partial skeleton as an elephantine quadruped. To add to this inaccuracy, Mantell initially restored the dinosaur with a horn on its nose, based on a

bone that was later shown to be a thumb-spike. A large number of complete Iguanodon skeletons were discovered in Belgium in 1878 and reconstructions at that time favoured a bipedal, upright stance, based on the dinosaur's considerably smaller forelimbs.<sup>7</sup> Modern study, however, has brought us full circle and Iguanodon is currently considered predominantly quadrupedal, although more lightly built than the Victorian palaeontologists had envisioned.

Hawkins' Crystal Palace sculptures are often held up as an example of scientific inaccuracy: lumbering, Victorian behemoths from science's adolescence that would swiftly be corrected and updated. But this misses how remarkably advanced and ambitious the project was, and the noble idea of public education that it embodied. Given the paucity of fossil material that Owen and Hawkins had to work with, the fact that they got a lot of the fundamental characteristics of these animals correct is nothing short of miraculous. Bear in mind too that what we consider correct in palaeontology is subject to constant revision. One can only imagine how modern reconstructions of dinosaurs will be judged in 160 years' time, and speculate whether any will be as enduring as Hawkins' magnificent sculptures.

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The Tiegs Museum ([biosciences.unimelb.edu.au/engage/tiegs-museum](https://biosciences.unimelb.edu.au/engage/tiegs-museum)) is used principally in teaching undergraduate classes.

- 1 B. Waterhouse Hawkins, 'On visual education as applied to geology, illustrated by diagrams and models of the geological restorations at the Crystal Palace', *Journal of the Society of Arts* (London), vol. 2, no. 78, 19 May 1854, pp. 444–9.
- 2 Hawkins, 'On visual education as applied to geology'.
- 3 By 1854, Tennant laid claim to the impressive and unique title of 'Mineralogist to Her Majesty'. (Hawkins, 'On visual education as applied to geology'.)
- 4 Henry A. Ward, 1866, quoted in Jane P. Davidson, 'Catalogue of casts of fossils (1866) and the artistic influence of Benjamin Waterhouse Hawkins on Ward', *Transactions of the Kansas Academy of Science*, vol. 108, nos 3–4, Fall 2005, pp. 138–48.
- 5 Most of the records in the register are undated; these are the only two recorded dates on either side of the entries for the dinosaur models.
- 6 Monica MacCallum, 'Sweet, Georgina (1875–1946)', *Australian dictionary of biography*, vol. 12, Melbourne University Press, 1990.
- 7 Photographs taken in 1882 of the skeletons being mounted in the Royal Belgian Institute of Natural Sciences show workers using wallaby and cassowary skeletons as a guide to Iguanodon's posture.