

To mark the Royal Society's 350th birthday, **Patricia Fara** looks at discoveries associated with the institution

1842 Richard Owen invents the word 'dinosaur'

ON NEW YEAR'S Eve 1853, a macabre dinner party was held at London's Crystal Palace. Hosted by Richard Owen (1804–92), one of Britain's leading palaeontologists, it took place inside the large concrete model of an iguanodon, a dinosaur originally identified from a few mysterious teeth found in a quarry. With only fossil fragments to work from, deducing the structure of extinct animals involves inspired detective work – and disagreements abound. A notoriously bad-tempered man, Owen cannot have been pleased to see that his temporary dining room sported a horn on its snout, the conclusion of his arch rival, Gideon Mantell.

In 1842, Charles Darwin had not yet published *On the Origin*

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of *Species*, but evolution was already a contentious topic. Although Mantell had discovered the iguanodon and chosen its name, it was Owen who coined the word 'dinosaur', a Greek amalgam meaning 'terrible great lizard'. Interpreted charitably, Owen was trying to make sense of all the fossil reptiles that had so far been discovered. Viewed more cynically, he was an ambitious young career scientist attacking Mantell, an older doctor who worked on fossils in his spare time.

Mantell claimed that, as exceptionally large relatives of iguanas, iguanadons had been over 60 feet long. Owen contradicted Mantell by establishing dinosaurs as a separate order of reptiles, and by ensuring that the iguanodon on display at Crystal Palace was less than half that length.

Concealed behind Owen's definition of dinosaurs lay yet another hidden agenda: he wanted to disprove evolution. Before Darwin, evolutionary theories generally implied progress as organisms developed from lower to higher ones over several generations. With dinosaurs, Owen fashioned himself a tailor-made counter-example. According to him, dinosaurs were more advanced than modern

lizards because they stood up on four legs rather than resting their bellies on the ground. To clinch his case, he pointed to the absence of superior dinosaur descendants in the geological strata

immediately above them.

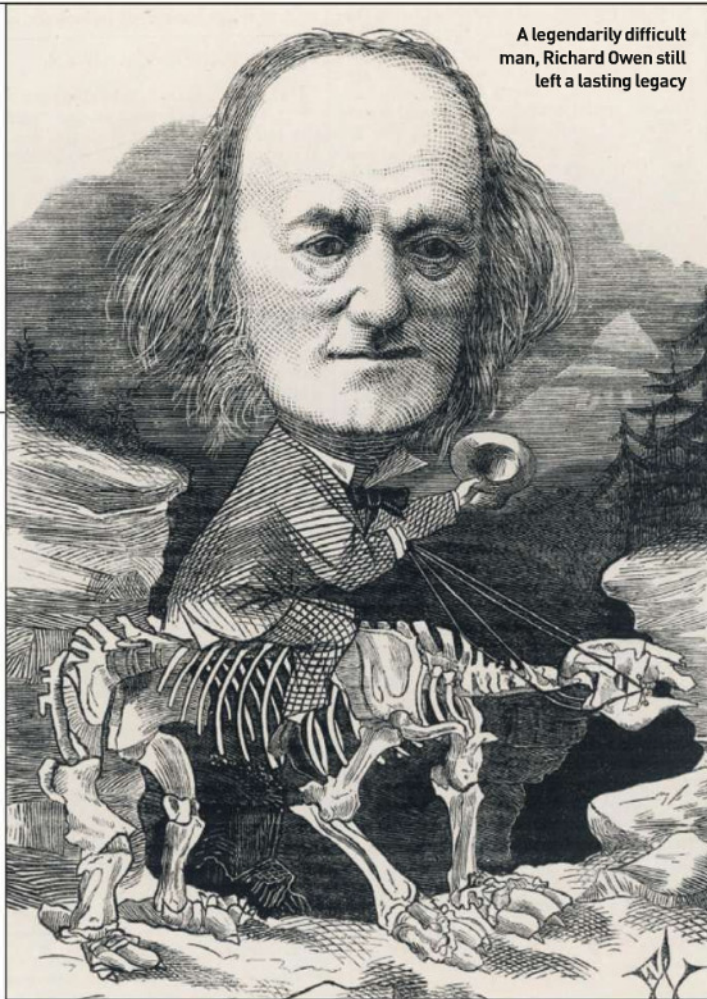
Owen rejected progressive evolution, but he did believe in change. A religious man, Owen could not accept the absence of purpose in Darwin's theory of natural selection. He maintained that God envisaged ideal archetypes which do not exist physically, but represent a divine fundamental plan linking groups of organisms. For example, giraffes and frogs are very different, but they do share a skeletal structure distinguishing

them from worms. In contrast, Darwin argued that vertebrates resemble each other not because they have the same archetype, but because they stem from a common ancestor.

When Darwin finally went into print, Owen was an establishment scientist, and it was his turn to be criticised by a younger upstart with a forceful turn of phrase – Darwin's bulldog, Thomas Huxley. In Huxley's view, archetypes were metaphysical nonsense, while dinosaurs were intermediaries providing excellent evidence of evolution. Additional fossilised remnants had been collected, and it became clear that some dinosaurs were small and walked on two legs like a bird; conversely, *Archaeopteryx* was classified as a bird, but retained the long tail and strong curved claws typical of a reptile.

Loathed and feared by many Victorians, Owen neither

A legendarily difficult man, Richard Owen still left a lasting legacy



admitted his mistakes nor confessed to the lies that characterised his hostility towards Mantell and Huxley. He did, however, bequeath a lasting tribute to dinosaurs: the central exhibition hall at London's Natural History Museum. **II**

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JOURNEYS

Website

► The Royal Society has launched an interactive 'Trailblazing' timeline of iconic moments in science history. Go to <http://trailblazing.royalsociety.org/>

Radio

► Melvyn Bragg has been discussing 'The Royal Society and British Science' on Radio 4's *In Our Time*. For more details, go to www.bbc.co.uk/programmes/b00pkh7

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