‘Enormous Fossil Animal and Almost Perfect Skeleton’

Bicentenary Symposium

To mark the first scientific accounts of the
Megalosaurus (Buckland) and *Plesiosaurus* (W.D. Conybeare),
read at the Geological Society meeting of February 20th 1824

Wednesday 21st February 2024
At Oxford University Museum of Natural History

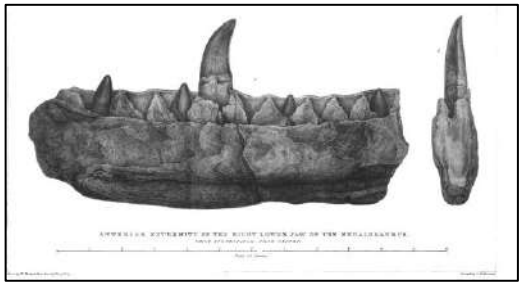
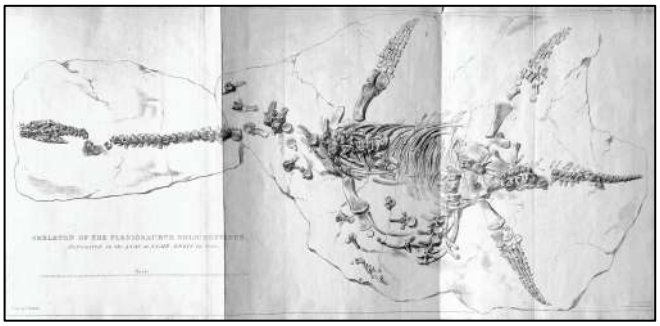


Image: courtesy of the Trustees of Natural History Museum



Organised by the History of Geology Group
and the Oxford University Museum of Natural History

Symposium Programme Presentations are 20 minutes (15 + 5 minutes for questions and discussion).

10.00	Registration	
10.20–10.30	Welcome, introduction, house arrangements	
10.30–11.30	Session 1 1.1 The meeting at the Geological Society of London on February 20th 1824 1.2 "The most wonderful wonder ever discovered': Mary Anning's 1823 *Plesiosaurus* 1.3 A trio of plesiosaurs for Christmas: the three plesiosaur skeletons discovered by Captain Waring and Miss Anning of Lyme Regis in December 1823	3 papers Duncan Hawley Tom Sharpe Dr Mark Evans & Dr Michael Taylor
11.30 –11.50	Break (tea/coffee + biscuits)	
11.50–12.50	Session 2 2.1 Bones before Buckland: Discoveries of dinosaur bones in Stonesfield before the 19th century 2.2 *Megalosaurus:* Curating a Global Icon 2.3 Unearthing the Buckland Archive at OUMNH: an archivist's insights	3 papers Philip Powell Dr Emma Nicholls Danielle Czerkaszyn
12.50–13.40	Lunch	
13.40–15.00	Viewing Session – Participants will rotate, with the opportunity to see all four collections: 1. *Megalosaurus* type material: presented at the 1824 meeting, by William Buckland 2. Archive material: related to William Buckland, W.D. Conybeare and Mary Morland 3. *Plesiosaurus dolichodeirus*: contemporary cast, by Sir Frances Chantrey, of the specimen displayed at the 1824 meeting 4. Stonesfield Quarry, beyond the *Megalosaurus*	4 sessions Divided into 20 minute slots, including 5 minutes within each slot for changeover
15.00– 16.20	Session 3 3.1 The Ammon Knight and the Phat Duke: William Buckland's sociability, social connections and science 3.2 Mary Morland and *Megalosaurus*: the task of making Illustrations for William Buckland 3.3 Four big lizards, four big egos and the roles played by 'outsiders' in the discovery, description and naming of fossil reptiles in southern England in the 1820s. 3.4 Richard Owen and his interpretation, classification and naming of 'Dinosauria'.	4 papers Dr Peter Lincoln Dr Susan Newell Martin Simpson Dr Chris Duffin
16.20–16.40	Break (tea/coffee + biscuits)	
16.40–17.40	Session 4 4.1 *Plesiosaurus* as represented in *Duria antiquior* and its derivatives 4.2 Waterhouse Hawkins' dinosaurs at Crystal Palace: legacies of *Megalosaurus* and *Plesiosaurus* 4.3 The Evolution of the Fictional *Megalosaurus*, 1836–1912	3 papers Prof. Renee Clary and Tom Sharpe Dr Mark Witton Dr Richard Fallon
17.40–17.45	Closing Remarks	

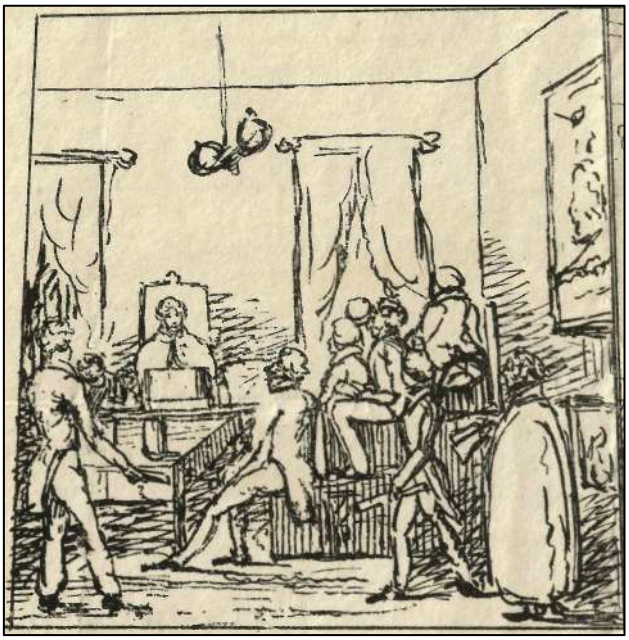
ABSTRACTS

Session 1

1.1 A sketch of the meeting at the Geological Society of London on February 20th 1824

Duncan Hawley

duncan.hawley.hogg@gmail.com



Lithograph of a sketch of the Geological Society of London Meeting Room at 20 Bedford Street by H.T. De La Beche.

A considerable air of anticipation ran ahead of the meeting of the Geological Society on Friday February 20th 1824. Two weeks earlier William Buckland (1784–1856) had been elected President of the Society and this was his first meeting in the Chair. Three weeks earlier Buckland's friend and colleague, William Daniel Conybeare (1787–1857) had shown a drawing of a recently recovered Plesiosaurus whilst attending a scientific society meeting in Bristol, repeated a week later at a Royal Society soirée in London.

News of this specimen and that it was to be displayed at the February meeting was broadcast amongst those 'in town' and beyond. Its reported size, form and 'nearly entire' state causing a flurry of excitement amongst Society Members and many another gentlemen confessing a scientific interest. At least fort-seven were present at the meeting, of which twenty-two were Members and the other twenty-five were visitors. Buckland described the meeting as "the largest I ever remember" and "so crowded an audience".

Geological Society meetings were held on the first floor of a leased 4-storey town house, number 20 Bedford Street, near Covent Garden, accessed by a narrow staircase from the ground-floor entrance corridor. It was furnished with tiered bench-seating set out in parliamentary style, with a central table for laying out specimens, diagrams, maps and charts. Other floors of the house were occupied with the Society's growing museum and library. The cased Plesiosaurus specimen arrived on the morning of the meeting but it was too large to negotiate the staircase, so had to remain in the entrance corridor.

Following a customary convivial dinner at a tavern the meeting commenced at 8.30pm. Buckland opened the meeting and first to lecture was Conybeare on his almost perfect skeleton 'monster'; the audience took to the entrance corridor and stairs where they heard an anatomical analysis leading to reasoned speculation on its probable mode of life. Then Buckland gave his 'Notice on the Megalosaurus or Great Fossil Lizard of Stonesfield', with fragments of his reptile laid out on the table, which he calculated to have been 60 to 70 feet in length. Thus, with approval from classics scholar Conybeare, he assigned the name of this 'enormous fossil animal' Megalosaurus. Buckland cross-referenced material found by Mantell in the Weald, who had brought some of his bones and vertebrae to the meeting. In discussion, Buckland charged the botanists at the meeting (Fellows of the Linnean and Horticultural Societies) with not giving enough attention to fossil plants; these found at both Stonesfield and at Tilgate. A non-fossil contribution, from Member and mining man John Taylor (1779-1863), persuasively argued for instituting a scientific school for Cornish mine captains, by which Conybeare was impressed.

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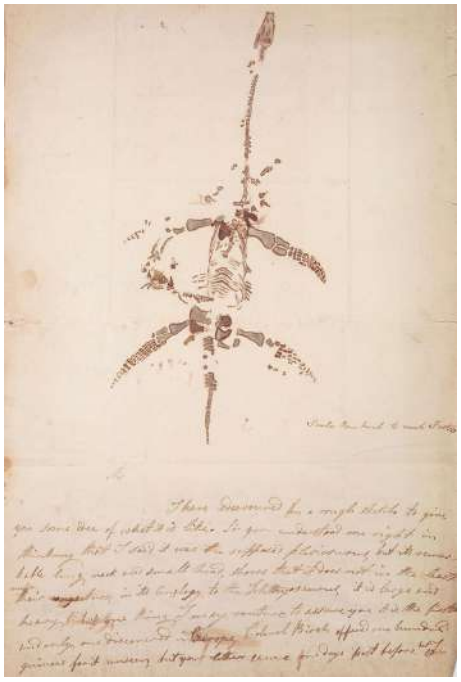
Duncan Hawley

Duncan was first exposed to the 'greats' of the heroic age when studying geology at school, then at UCL and Aberystwyth. He enjoyed a varied career as a geography and geoscience educator in schools and teacher education, and is known for his work on teaching physical geography. Maintaining an interest in history of geology throughout, he joined HOGG in 1995, and has interests in early geological maps, the life and work of G.B. Greenough and Murchison's early Silurian fieldwork in mid-Wales. He is Chairperson of HOGG and Sheffield Area Geology Trust and member of INHIGEO.

1.2 'The most wonderful wonder ever discovered': Mary Anning's 1823 *Plesiosaurus*

Tom Sharpe
tom.sharpe1@icloud.com



Mary Anning's drawing of her 1823 *Plesiosaurus*, drawn on a scale of 'One Inch to each Foote' in a letter to Sir Henry Bunbury (1778–1860), 26 December 1823.

Mary Anning (1799–1847).
Image courtesy of the Geological Society of London.

Described and named in 1821 from partial and disassociated remains and lacking a head, the skeleton of *Plesiosaurus* was only fully revealed with the discovery by Mary Anning of a near-complete specimen at Lyme Regis on 10 December 1823. Recognising its significance as 'the first and only one discovered in Europe', she sent news of her find to potential purchasers, some of her letters accompanied by well-executed scale drawings. At least ten copies of her drawing were soon in circulation, with Georges Cuvier in Paris receiving three.

After some competition the specimen was purchased by Richard Grenville (1776–1839), 1st Duke of Buckingham, probably for £110, that acquisition a disappointment to Charles Konig (1774–1851), aggrieved that it had not been offered to the British Museum.

William Conybeare first learnt of the specimen from William Buckland on 27 January 1824 and received a drawing from Anning in time for it to be exhibited at a meeting of the Bristol Philosophical Society on 30 January. Conybeare then travelled to Oxford, and at Buckland's request continued to London to await the arrival of the ship carrying the specimen from Lyme. Conybeare displayed Anning's drawing at the Royal Society Club on 5 February and would surely have done the same at the Geological Society on 6 February. Having whetted the appetite of the geologists, Conybeare expected 'an overflowing meeting of the Geological Society' on 20 February when he hoped to make his 'crocodiles roar as loud as Buckland's Hyaenas'.

The specimen arrived just in time, and anticipating that its size and weight would be an issue, Conybeare had asked Thomas Webster to exercise his 'best sagacity how this fine monster is to be conveyed upstairs'. Measuring about 140 by 270 cm, and probably weighing several hundred kilograms, the specimen defeated attempts to carry it up to the meeting room and Conybeare was obliged to exhibit it in the hallway.

Its small head and the scatter of vertebrae at the base of the surprisingly long neck attracted the close attention of the geologists, anxious to ascertain whether the neck and body were indeed associated as this had been questioned. Their study cast aside any doubts in the minds of most.

The specimen remained at Stowe, Buckingham's home, until 1848 when the house and contents were sold by auction. Buckland, who had purchased it for Buckingham in 1824 for over £100 now bought the specimen for just eight guineas on behalf of the British Museum.

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Tom Sharpe

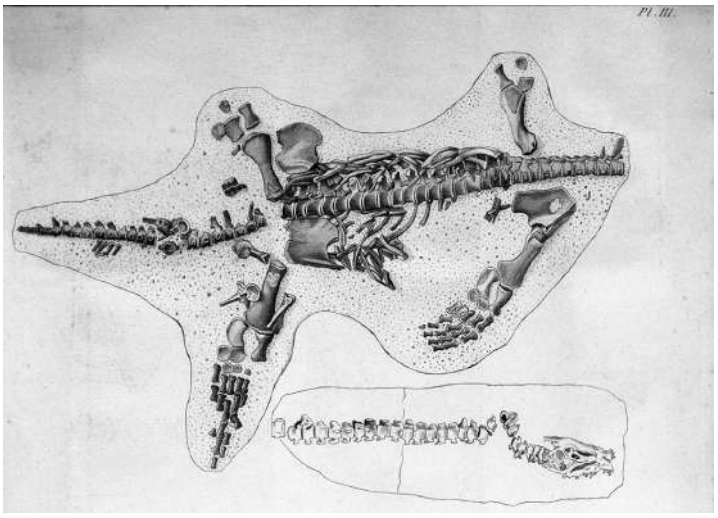
Tom was Curator of Palaeontology and Archives at the National Museum of Wales 1978–2013 and is a former Chair of the Geological Curators' Group and the History of Geology Group.

HIs biography of Mary Anning, *The Fossil Woman A Life of Mary Anning* was published by The Dovecote Press in 2020.

1.3 A trio of plesiosaurs for Christmas: the three plesiosaur skeletons discovered by Captain Waring and Miss Anning of Lyme Regis in December 1823.

Mark Evans
British Antarctic Survey, Cambridge;
School of Geography, Geology and the Environment, University of Leicester
maans@bas.ac.uk

Michael A. Taylor
School of Museum Studies, University of Leicester;
Department of Natural Sciences, National Museums Scotland
mat22@leicester.ac.uk



Engraving of the Plesiosaur specimen from Lyme-Regis bought by Constant Prévost illustrated in the third edition of Cuvier, G.1825 *Discours sur les révolutions du globe*, 3rd edn., with added neck and of the skull of the specimen bought by the Duke of Buckingham.

Fossils now identifiable as plesiosaurian were first recorded in the seventeenth and eighteenth centuries. Two partial skeletons survive in the Natural History Museum, London, one described by William Stukely in 1719. The generic name *Plesiosaurus* was erected by De la Beche and Conybeare in 1821. Their key specimen was a partial disarticulated skeleton in the collection of Colonel James Birch. Some of this specimen survives in the Oxford University Museum of Natural History. However, incorrectly repositioned limb elements led to an inaccurate anatomical reconstruction. This perhaps influenced the creation of the generic name *Plesiosaurus*.

In December 1823 three plesiosaur skeletons were discovered over the course of 10 days at Lyme Regis, Dorset, UK. The apparent coincidence arises from violent southerly gales that struck the coast at this time, generating favourable collecting conditions. Lyme resident Captain Henry Waring R.N. discovered the first skeleton and organised its collection. A second skeleton was found by Mary Anning the following day. Eight days later, Anning found the third skeleton, which was conjectured to be a *Plesiosaurus*.

Waring's specimen has been identified as that one bought by the visiting Constant Prévost for the Muséum national d'histoire naturelle, Paris. However, the history of this specimen and Waring's role have become confused; local sailors, supervised by Anning, have also been credited with its discovery later in 1824. Recently discovered evidence confirms Waring as the original collector and more generally as someone offering highly priced specimens for sale.

Anning's first skeleton was, of course, that described and exhibited by Conybeare at the Geological Society meeting in February 1824.

In his 1824 paper Conybeare referred to another specimen with an "entire vertebral column", found contemporaneously with the one described, which had been presented to the "museum at Oxford" by William Buckland. We reject a previous identification of this specimen in the Oxford collections, the basis for the supposed stratigraphical occurrence of *Plesiosaurus*. Rather, we identify it as a postcranial skeleton that includes an almost complete series of 85 vertebrae. Notably, the tarsal bones are artificially arranged similarly to those of the Birch specimen, suggesting that this skeleton was prepared and mounted before the true arrangement, as shown by the first Anning specimen, was widely known. We identify it as the second Anning specimen, and the third of the 1823 plesiosaurs.

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Mark Evans

Mark carried out his doctoral research at the University of Leicester whilst Curator of Geology and Natural Sciences at Leicester Museum and Art Gallery. He is now Geological Laboratory and Collections Manager at the British Antarctic Survey and is an Honorary Research Fellow at the School of Geography, Geology and the Environment, University of Leicester. His research interests are focussed on the anatomy, systematics and history of Mesozoic marine reptiles, particularly plesiosaurs. He was a leading palaeontologist on the 2021 excavation of the Rutland Water ichthyosaur, the largest British fossil reptile skeleton ever discovered.

Michael A. Taylor

Michael undertook his doctoral research in the University Museum of Natural History, Oxford. Now retired, he is Honorary Research Fellow at the School of Museum Studies, University of Leicester, and Research Associate, National Museums Scotland. His research interests include the Jurassic marine reptiles of the West Country and the history of their collectors and museums. He is currently working on various aspects of Mary Anning, Thomas Hawkins, and Henry Waring.

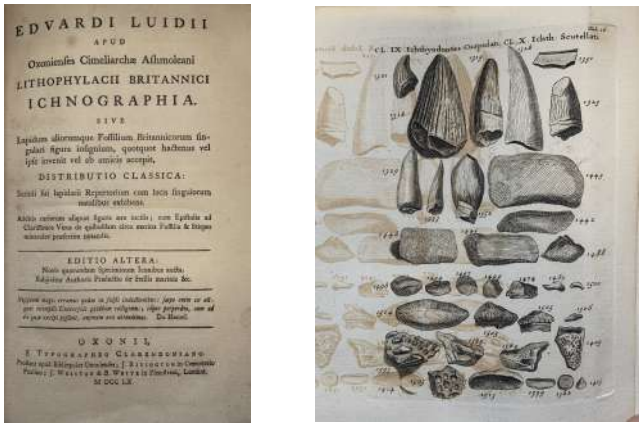
Session 2.

2.1 Bones before Buckland: Discoveries of dinosaur bones in Stonesfield before the 19th century

Phillip Powell

Honorary Associate, Oxford University Museum of Natural History (OUMNH)

philip.powell@oum.ox.ac.uk



Title page and Plate 16 from Edward Lhwyd's, *Lithophilacii Britannici Ichnographia* (1699), the first catalogue of English fossils.

Title page and Plate 8 from Robert Plot's *Natural History of Oxfordshire* (1677)

Although discoveries of big bones from Stonesfield are recorded, records from the 16th and 17th centuries are sparse. However, in 1677 Robert Plot, Keeper of the Ashmolean Museum described a dinosaur bone from another north Oxfordshire locality. His description of the specimen as a petrifaction rather than a formed stone or sport of nature indicates an advance towards the understanding of the true nature of fossils.

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Philip Powell

Philip was assistant curator of the geological collections at the Oxford University Museum of Natural History from 1963 – 2003. In 1994 he discovered a short-necked plesiosaur in a gravel pit at Yarnton, Oxfordshire, now on display in the museum and described in this OUMNH short video https://youtu.be/vVGT5YmzNj4?feature=shared

Now retired he continues to work as an Honorary Associate at the museum with special interests in fossils, building stones and local geology. He is author of *The Geology of Oxfordshire* and co-author with Nina Morgan of the *Geology of Oxford Gravestones* and *A Story in Stone: The Geology of the Oxford University Museum of Natural History Building*. All his books are available from the website: www.gravestonegeology.uk

2.2 *Megalosaurus*: Curating a Global Icon

Dr Emma Nicholls FGS

Oxford University Museum of Natural History (OUMNH)
emma.nicholls@oum.ox.ac.uk

Megalosaurus dentary J.013505. © Oxford University Museum of Natural History

The iconic dentary, with only a single fully erupted tooth, is a specimen known to dinosaur scientists and enthusiasts worldwide. It is the type specimen of *Megalosaurus*, the first dinosaur ever scientifically described. *Megalosaurus* would go on to become one of the three animals for which the term Dinosauria was erected, over two decades later.

One could argue, this partial jaw is the single fossil that represents the beginning of the global phenomenon that is dinosaurs!

Being responsible for the 'care and use' of a specimen that is so in the public eye, and idolised by many for its historic importance, is an exciting, and occasionally daunting, role.

In a museum, 'care of collections' is of greatest importance. Museums exist to facilitate access to collections for all. However, it is also our responsibility to ensure the longevity of the specimens, so they remain available for use in research, teaching and display, for as long as possible. Caring for the collections includes safety and security both in-house and off-site. A recent trip to London with the *Megalosaurus* dentary presented an exciting and unique set of challenges. Caring for collections also means meeting basic, physical needs such as appropriate environmental conditions, which can be very difficult in an historic building.

'Use of collections' is a huge topic, but one of the primary areas of use within museums is public engagement, including outreach, digital content, and display. *Megalosaurus* specimens from the Museum's collections have been on public display in a variety of ways since the Museum opened its doors in 1860. Exhibitions of the distant past however, wouldn't stand up to the expectations of a modern audience. An important element of public engagement is to keep museums relevant, engaging and exciting, both in our physical spaces as well as the digital realm.

The Museum is currently undertaking an exciting redisplay of its dinosaur material. However, for those not already enamoured with dinosaurs such as *Megalosaurus*, how do we take a few disarticulated bones from 166 million years ago, and engage new and diverse audiences in a modern world.

This paper will explore the current scientific understanding of this legendary Jurassic predator, delve into how *Megalosaurus* specimens have been used for exhibition and education, and reveal what can happen when you apply cutting edge technology to these historic bones, that have been inspiring palaeontologists and the public for over 200 years.

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Dr Emma Nicholls

Emma is the Collections Manager for Vertebrate Palaeontology at the OUMNH. She is responsible for the care and development of the collections, which includes documentation and digitisation, research, exhibitions, and public engagement. Emma is also the coordinator for the Museum's exciting programme of *Megalosaurus* Bicentenary celebrations, running throughout 2024.

Emma's contributions to the sector have been recognised by several museum awards, including *Limited Budget Project of the Year* at both the Grant Museum and the Horniman Museum, and *Art Fund Museum of the Year*, won by the Horniman in 2022.

Emma sits on numerous committees and is Chair of the Geological Curators Group, which is celebrating its 50th anniversary in 2024. In terms of research, Emma has worked across a variety of vertebrate groups but her primary interest lies in Mesozoic selachians and reptiles. Amongst other field projects, she was part of the team of palaeontologists that excavated the Rutland Ichthyosaur, as seen on *Digging for Britain.*

2.3 *Unearthing the Buckland Archive at OUMNH: an archivist's insights*

Danielle Czerkaszyn
Oxford University Museum of Natural History (OUMNH)
danielle.czerkaszyn@oum.ox.ac.uk

A selection of material in the Buckland Archive at OUMNH

One of the great research resources at Oxford University Museum of Natural History is the specimen and archive collection of William Buckland (1784-1856), pioneering geologist and Dean of Westminster. When Buckland died in 1856, a huge volume of papers and around 4000 specimens, were given to the University and these were transferred to OUMNH when it opened in 1860. Divided into three broad sections (correspondence, papers, and teaching illustrations), this archive collection reflects the passion for geology that permeated Buckland's life. Moreover, after a major fundraising campaign in 2022, OUMNH acquired another extremely important collection of material related to William Buckland. Passed by descent to the current owners, this separate archive consists of just over 1,000 items of correspondence, geological notes, works of art and family papers. The papers relate to Buckland himself and also other family members, including his wife Mary and their eldest son, the naturalist and author Francis (Frank) Buckland. As a result of this acquisition, OUMNH is now home to the largest and most important archive of this pioneering geologist and his family.

Diving further into the provenance of this unique and rare archive, the trials and tribulations surrounding OUMNH's campaign to bring Buckland's papers together under one roof are outlined. Highlights from this archive will be shared, with a particular focus on the newly acquired material and the untapped research potential it holds. Finally, the next steps for the Buckland archive are discussed, including conserving the new acquisition, cataloguing and digitisation the entire archive, and public engagement in the year of the in the year of the *Megalosaurus* bicentenary.

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Danielle Czerkaszyn

Danielle is responsible for management of the Library and Archive at Oxford University Museum of Natural History, including the development, digitisation, collections care, promotion and access of collections, which includes published works and original material. She supports museum staff, academics, researchers, and members of the public with an interest in natural history or the Museum's collections. Danielle received a BA in History from the University of Guelph, an MA in History from the University of Western Ontario, an MA in Museum Studies from the University of Leicester, and an MA in Library and Information Services Management from the University of Sheffield.

Viewing Session

Viewing 1.

Megalosaurus type material: presented at the 1824 meeting by William Buckland

Two hundred years ago, Oxford University geologist William Buckland published the first ever scientific description of a dinosaur, presenting his paper to the Geological Society of London on 20th February 1824. The fossils illustrated in his paper – including the famous partial dentary – were found in Oxfordshire in the late 1700s/early 1800s and are held in the collections at the Oxford University Museum of Natural History. This behind the scenes viewing of the collections showcases the surviving type specimens, including the iconic lower jaw which has become the symbol of both *Megalosaurus* and the start of dinosaur science.

The iconic *Megalosaurus* dentary

Viewing 2.

Archive material related to William Buckland, W.D. Conybeare & Mary Morland

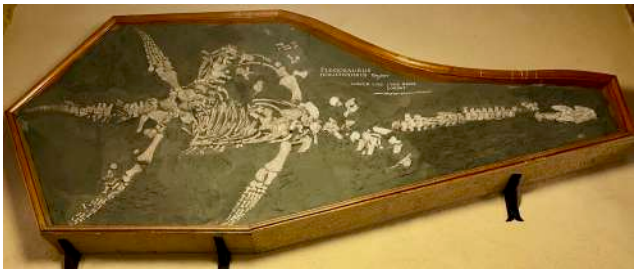
Drawing from OUMNH's William Buckland Archive, a selection of unique items on display includes a watercolour of the 1839 Axmouth landslip by Mary Morland, a rare coloured copy of *Duria Antiquior* and Thomas Sopwith's watercolour of a geologist with hammer, widely reproduced as a portrait of Mary Anning but recently identified by Tom Sharpe as a depiction of Buckland researching glaciation in Snowdonia in 1841. Also on display are a variety of original letters by many of Buckland's key contemporaries from Henry de la Beche and William Daniel Conybeare to Mary Anning and Elizabeth Philpot, along with several written by Buckland himself.

Watercolour of William Buckland conducting fieldwork in North Wales, by Thomas Sopwith.

Viewing 3.

Plesiosaurus dolichodeirus: contemporary cast, by Sir Frances Chantrey, of the specimen displayed at the 1824 meeting.

Sir Frances Chantrey (1781–1841), originally from Norton near Sheffield, was a successful society sculptor and his business was chiefly producing fine busts of the well-to-do. But he also had a strong interest in the emerging science of geology - he was elected a Member of the Geological Society of London in 1814. He was a close friend of William Buckland. One of Chantrey's contributions to the geology was to produce faithful casts of fossil remains. The Plesiosairus on display at OUMNH is a fine example of his work, one of at least five casts made from a mould of the Duke of Buckingham's 'Brute' that was on show at the 1824 Geological Society meeting. He gave one to the Geological Society, another to Baron Cuvier in Paris and one to Buckland for Oxford – now displayed in the Oxford Museum of Natural History. The fate of the other two casts is not known.



The Plesiosaursus cast by Chantrey
c. 1830
Image : Duncan Hawley

Viewing 4.

Stonesfield Quarry, beyond the *Megalosaurus*

It was recognised from early fossil discoveries at Stonesfield that the fossil fauna is diverse, including sharks, bony fish, crustaceans, pterosaurs, marine crocodiles dinosaurs, and mammals. Consequently it is historically and scientifically very important. Stonesfield was once part of a lagoonal environment, on the coast of a warm, shallow sea that covered Oxfordshire in what is now termed the Middle Jurassic. Opportunity to see some of this material up close includes the first Mesozoic mammal material ever discovered.

Mesozoic mammal jaw
Phascolotherium bucklandii from Stonesfield

Session 3.

3.1 The Ammon Knight and the Phat Duke: William Buckland's sociability, social connections and science

Peter Lincoln

Associate Researcher, Oxford University Museum of Natural History (OUMNH)

peter.c.lincoln@gmail.com

Left image: part of a sketch in a letter by J.P. Hughes in the Buckland Archive (courtesy of OUMNH)

Right image: a caricature portrait of Richard Temple-Nugent-Brydges-Chandos-Grenville, first Duke of Buckingham and Chandos (1776-1839), known until 1813 as Earl Temple, by Robert Dighton (1811) Source: CC BY-NC-SA 4.0 © Trustees of the British Museum.

As a man of science William Buckland was a product of the Regency. It was not only the time when he cut his teeth as a geologist, but his two Oxford readerships were created, especially for him, by fiat of the Prince Regent himself. In that strangely uninhibited period, Buckland's engaging and naturally exuberant personality was perhaps less exceptional than it would later become. It certainly had a wide appeal among many of his contemporaries, which not only allowed him to push at boundaries of convention to make some seemingly extraordinary scientific claims, but also, allegedly, led to him being dubbed by his students the 'Ammon Knight'. Paradoxically, his innate conservatism and sense of the expedient enabled him to establish a career in the new science of geology while maintaining credibility within both his university and the church, two bastions of the orthodox. As well as his own scientific work he used his sociability and social connections to encourage and enable several networks of collaboration and, in so doing, helped forward the cause of geology and science in general.

Starting with a brief look into Buckland's immediate ancestry it is suggested that the roots of his own zealous pursuit of patronage owed as much to the influence of his father and uncle as to his own personality. Then, following a brief examination of his character (during which it is hoped to dispel some of the more lurid fables often attached to his name) his adept use of patronage and

networking, enumerating some of the fruitful connections he established are described. These included an unlikely alliance with the heroically named, but widely reviled, Richard Temple-Nugent-Brydges-Chandos-Grenville, the 1st Duke of Buckingham and Chandos, (the 'Phat Duke' of the title), who became the owner of the *Plesiosaurus* that was described at the 1824 meeting.

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Peter Lincoln

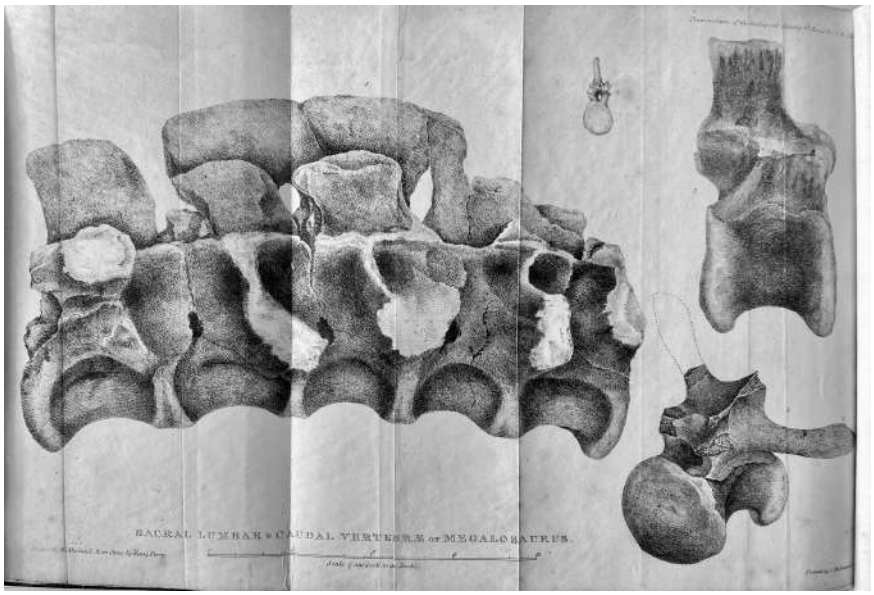
After a short career in shipbuilding and a rather longer time teaching in a variety of schools, Peter studied history and philosophy of science at UCL, where he wrote a dissertation on the short-lived Ipswich Philosophy Society and the early development of that town's museum. Having developed an interest in the people involved in science in the early nineteenth century, he expanded his studies at the University of East Anglia with a PhD centred on the life and work of William Buckland. He is an Associate Researcher at the OUMNH and is currently editor of HOGG's members' magazine *GeoHistories*.

3.2 Mary Morland and Megalosaurus: the task of making illustrations for William Buckland

Dr. Susan Newell

Associate Researcher, Oxford University Museum of Natural History (OUMNH)

Susan.newell@oum.ox.ac.uk



Drawing of the 'Sacral Lumbar & Caudal Vertebrae of Megalosaurus' , by Mary Morland, which appears as Plate XV in William Buckland's seminal 1824 paper in *Transactions of the Geological Society*, Series 2, volume1.

The illustrations to William Buckland's 1824 *Megalosaurus* paper were credited to 'M. Morland' and we know that this denotes Mary Morland who lived near Oxford where he worked as Professor of Mineralogy and Geology at the university. Buckland's inner circle of geological friends were aware of the role of this genteel young woman as his amanuensis but others probably assumed, reasonably enough from this gender-neutral credit and the high standard of the work, that 'M. Morland' was a man, and probably a professional artist. Mary may have had drawing lessons in line with the standard instruction received by people of her class, but the technical, detailed work that she produced for Buckland's paper was of a different order.

This interdisciplinary paper builds on the earlier work of scholars from the fields of the history of art, natural history illustration, print publishing and geology to consider how the talented Mary Morland transformed herself into a scientific illustrator. It also considers what her drawing style tells us about authority and the contribution of artists, working in close collaboration with authors, to the dissemination of new scientific knowledge. Developments in the print medium and publishing were a crucial factor in this and I trace the afterlife of her original artwork in different publications.

On 31 December 1825 William and Mary were married. They continued their working partnership as man and wife for more than two decades. However, due to the conditions of women in nineteenth-century society Mary's role in this scientific partnership was almost completely obscured. As 'Mrs Buckland' she only once went on to publish her work when, in 1840, lithographs after her drawings were included in the sumptuous volume that Buckland and his friend, W. D. Conybeare, produced on the Axmouth landslip. But these views and the technical drawings alluded to above were only a part of Mary's work for Buckland. It is shown that a few publications and the rare surviving collections at the OUMNH have more to tell us about the contributions of this remarkable woman to early geological science.

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Susan Newell

Susan completed her PhD at the University of Leeds in 2023, and for her thesis, 'Museum Collections, Academic Teaching and the Making of Geology in the Nineteenth-Century University: the Case of William Buckland and the University of Oxford, 1813-1849', she drew mainly on the archives and collections at the OUMNH. She returned to academia in 2014 after a career as a decorative arts specialist in museums and auction houses. It was research for her Masters (Royal College of Art/V&A, 2016) on the ceramics holdings of the Museum of Practical Geology that first sparked her interest in collections related to nineteenth-century geology.

3.3 Four big lizards, four big egos and the roles played by 'outsiders' in the discovery, description and naming of fossil reptiles in southern England in the 1820s

Martin Simpson

Freelance Palaeontologist
martinsimpsoniow@hotmail.com

A rare photograph of Mary Mantell (1795–1869)
of unknown date but proably taken in the mid-1860s

In 1824 two distinct types of large, prehistoric 'lizards' were announced to the scientific world, *Megalosaurus* and the first complete *Plesiosaurus*. Two other huge fossil animals were already known, *Mosasaurus* and *Ichthyosaurus*, and another that was soon to be named *Iguanodon*. To the public, these creatures were the embodiment of mythical dragons and monsters, but soon came to be seen as symbols of failure through extinction. However, to geologists these were pioneering discoveries upon which significant reputations could be built.

William Daniel Conybeare, Henry De la Beche and William Buckland belonged to the scholarly stratum of geologists; they were friends and Members of the Geological Society, whose membership generally comprised wealthy gentleman and upper classes. Gideon Mantell, on the other hand, was a provincial surgeon with an ambition to join this select group of geologists, raise his standing and thereby make a name for himself. In the background, the French anatomist Georges Cuvier, Professor at the Muséum National d'Histoire Naturelle in Paris, offered influential opinions on the English finds, notably *Megalosaurus* and the forthcoming *Iguanodon*.

The scholarly tier, who were the ‘describers and namers’ of fossils, courted the major collectors of vertebrate specimens. These ‘gatherers' were often upper class individuals who, today, might be termed 'citizen scientists'. Both groups were dependent to a significant extent upon a disparate group of 'outsiders.' These were the 'fossilists' or dealers, the quarrymen or beachcombers, who supplied the growing demand for fossil specimens. However, their roles have sometimes been overlooked and not fully credited. The role played by Mary Ann Mantell, wife of Gideon, is analysed to demonstate how her contribution was more substantial than simply ‘bolstering’ her famous husband.

Evidence is presented that substantiates the ‘classic’, but disputed, story that the first discovery of *Iguanodon* teeth was by Mary Mantell, found during a walk in Sussex in 1821. Other well-known claims that have appeared in historical accounts are also discussed. Importantly, the role of the Mantells during the time leading up to the important meeting at the Geological Society in 1824 is shown as having spurred Buckland into finishing his description of the 'Huge Stonesfield Lizard'. Claims suggesting discoveries of Wealden *Megalosaurus* specimens are discussed and shown to be erroneous due to a lack of the diagnostic material in that fauna; this would have shown that the Wealden fauna was different to that at Stonesfield but included unrelated, large theropod dinosaurs which would not be understood or classified for many decades. This demonstrates the importance of using primary and reliable sources, including newspaper archives and manuscripts, in establishing accurate history of geology narratives that avoid merging fact with fiction.

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Martin Simpson

Martin is a freelance palaeontologist who studied at Portsmouth and Glasgow. He is based on the Isle of Wight, having spent the last 42 years collecting fossils from the Lower Greensand. Although specialising in fossil lobsters, he has amassed a large collection of ammonites and collaborated with the late Dr Raymond Casey. Martin has produced papers on decapod crustaceans, Lower Greensand stratigraphy, geotourism and the history of Isle of Wight geology. He is an avid book and manuscript collector and has a keen interest in the history of British palaeontology, particularly relating to Thomas Webster and Gideon Mantell.

3.4 Richard Owen and his interpretation, classification and naming of 'Dinosauria'

Christopher J. Duffin
The Natural History Museum
cduffin@blueyonder.co.uk

Richard Owen on his 'hobby horse'

Anonymous.1873. Professor Owen. p.37 in: *Cartoon portraits and biographical sketches of men of the day. The drawings by Frederick Waddy.* London: Tinsley Brothers.

Richard Owen (1804-1892) was born in Lancaster and attended the Grammar School where one of his schoolfellows was William Whewell, and one teacher characterised Owen as 'lazy and impudent'. Apprenticed to an apothecary in 1820 he entered Edinburgh University in 1824, moving to London in 1825 as prosector at St Bartholomew's Hospital. In 1829 he became lecturer in comparative anatomy at the Royal College of Surgeons, and set about bringing order to the Hunterian Museum's collections under conservator William Clift. By the early 1830s, Owen became increasingly powerful in various learned societies and a ruthless side to his character emerged. That decade a series of classic zoological and paleontological studies saw him cement his reputation as the premier comparative anatomist; he was hailed as 'the British Cuvier'.

By the early 1840s, three genera of giant 'saurians' had been described and named, viz. *Megalosaurus* (William Buckland), *Iguanodon* and *Hylaeosaurus* (Gideon Mantell), but early knowledge of specimens, was limited by a paucity of high quality articulated material and lack of suitable extant models for comparative purposes. The British Association for the Advancement of Science (BAAS) commissioned a "Report on the present state of knowledge of

the Fossil Reptiles of Great Britain." It was the ambitious and politically connected Owen who was appointed to prepare the report. Owen travelled far and wide to examine specimens, presenting his review in 1840. Impressed, the BAAS commissioned an extension to include crocodiles, turtles and the enormous land reptiles that Buckland and Mantell had described. Owen examined many museum and private collections, including a large collection of bones from Tilgate made by George Bax Holmes (1803-1887).

In 1841 Owen gave the second part of his Report to the BAAS meeting at Plymouth, dividing the Reptiles into four groups including a new group of "very gigantic species which have now utterly perished". Owen suggested Mantell's earlier work should never have attempted to find similarities between ancient and modern reptiles, concluding that the name *Iguanodon* was totally inappropriate due to key anatomical differences between the extinct and extant Saurians. Additionally, features previously observed by Mantell were described as if Owen had been the first to realise them. Ten years earlier, Hermann von Meyer (1801-1869) had proposed a similar classification of four Saurian groups based on their limbs, one being analogous to the limbs of heavy land mammals. Relying on his influence, Owen improved and updated the text of his speech for publication, a move not normally acceptable. Owen noted that these giant reptiles did not have a sprawling gait but held their hind limbs beneath the body as in mammals, the bone had a cross section like that of mammals, and, crucially, he recognised five vertebrae fused to form a sacrum. Moreover, he used the vertebrae to estimate size, shrinking the *Iguanodon* to less than 10m. Obviously, a new name was needed for this remarkable group of animals - the Dinosauria was born.

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Christopher Duffin

A retired schoolteacher, Chris has research ties with the Natural History Museum, Bristol University and the Lauer Foundation in Chicago. He holds Ph.D. degrees in both Vertebrate Palaeontology and the History of Medicine. Mainly concerned with fossil sharks and their allies, his research also embraces various themes in the history of geology, including the development of palaeontology in Victorian times. Chris received the Mary Anning Award for outstanding contributions to Palaeontology in 2011 and the Marsh Award for Palaeontology in 2018.

Session 4.

4.1 Plesiosaurus as represented in *Duria antiquior* and its derivatives

Tom Sharpe

Renee M. Clary

Dunn-Seiler Museum at the Department of Geosciences, Mississippi State University

tom.sharpe1@icloud.com & rclary@geosci.msstate.edu

Left image: *Duria antiquior*, lithograph, 1829–30 by Henry De la Beche (1796–1855).

Right image: Frontispiece by John Martin from *Book of the Great Sea Dragons*, 1840 by Thomas Hawkins (1810–1889).

Henry De la Beche's famous watercolour and lithograph of 1829–30, *Duria antiquior*, illustrates many of the finds of Mary Anning in the Lias rocks of Dorset. *Duria* was published and sold to consolidate Anning's financial situation, bolstered as it was in 1829 by the sale of another complete *Plesiosaurus* and a pterosaur to the British Museum, and of an ichthyosaur and a *Dapedium* to Beriah Botfield (1807–1863). *Duria* was sold to Fellows of the Geological Society and by Anning herself in her shop in Lyme Regis and remained in print until October 1831 when the stone was to be rubbed down. By that time Anning had also discovered and sold *Squaloraja* as well as a further plesiosaur which she sold to Lord Cole for £200, all of which gave her unaccustomed financial security, at least temporarily.

Plesiosaurus takes centre-stage in *Duria*, locked in mortal combat with a large *Ichthyosaurus* which bites through the plesiosaur's neck, causing not only blood to gush from the wound but an evacuation of a string of proto-coprolites from its nether regions. In the original watercolour another plesiosaur, elsewhere in the scene, snaps at the tail of a crocodile on a shoreline, though in the lithograph it is attacking a submerged turtle, while a third plesiosaur snatches a pterosaur from the air. These elements were surely informed by William Conybeare's description of the plesiosaur's mode of life in his 1824 paper on the near-complete *Plesiosaurus* discovered by Anning, with added coprolitic components from an 1829 paper by William Buckland, with whom De la Beche collaborated on the production of *Duria*.

Duria was much reproduced (and still is today) and spawned many derivatives through the nineteenth century. Some were more tranquil adaptations of the scene while others emphasised the saurian struggle for dominance. Two contrasting examples are those in Thomas Hawkins' 1834 *Memoirs of Ichthyosauri and Plesiosauri*, and in his 1840 *Book of the Great Sea Dragons*, the former carrying a frontispiece of a lazily languid Lias scene by John Samuelson Templeton (*fl.*1830–1857), and the latter a wild, nightmarish gothic tableau by John Martin (1789–1854) in which crazed, wild-eyed plesiosaurs wreak their revenge on the ichthyosaurs.

Plesiosaurus faces up to a spouting *Ichthyosaurus* in a plate by Édouard Riou (1833–1900) in *La Terre avant le déluge* (1863) by Louis Figuier (1819–1894), and in the 1867 extended edition of *Voyage au centre de la Terre* by Jules Verne (1828–1905), also illustrated by Riou, they are once again locked in fatal combat. Verne's exaggerated description of the size of these animals could lead to some disappointment in his readers: on seeing the fossils at the British Museum in 1875, the poet Alfred Edward Housman (1859–1936) was disillusioned to find that 'the Ichthyosauri and Plesiosauri are by no means so large or terrific as those met by Professor Hardwigg and Co.'

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Tom Sharpe

Tom was Curator of Palaeontology and Archives at the National Museum of Wales 1978–2013 and is a former Chair of the Geological Curators' Group and the History of Geology Group.

HIs biography of Mary Anning, *The Fossil Woman A Life of Mary Anning* was published by The Dovecote Press in 2020.

Renee M. Clary

Renee is Professor of Geology and Director, Dunn-Seiler Museum at the Department of Geosciences, Mississippi State University. She has served as Chair of the Geological Society of America History and Philosophy of Geology Division and as President of the History of Earth Sciences Society. She was editor of GSA Memoir 218, *The Evolution of Paleontological Art*, published in 2022.

4.2 Waterhouse Hawkins' dinosaurs at Crystal Palace: legacies of *Megalosaurus* and *Plesiosaurus*

Mark P. Witton
School of the Environment, Geography and Geosciences, University of Portsmouth
mark.witton@port.ac.uk

Megalosaurus and Plesiosaurus make a 'reappearance' at Crystal Palace

Few 19th century reconstructions of fossil animals were as spectacular as the Crystal Palace Dinosaurs, a grand exhibit of geological and palaeontological sculpture developed between 1852 and 1855. The 37 palaeontological models of this installation were created by a team overseen by the artist Benjamin Waterhouse Hawkins, and were displayed alongside artificial geological strata created by another, separate group. Hawkins' team designed and built dinosaurs, marine reptiles, pterosaurs, temnospondyls, dicynodonts and mammals, among which was an enormous theropod, *Megalosaurus bucklandii*, and three species of *Plesiosaurus*: *Plesiosaurus dolichodeirus*, *"P". macrocephalus* and *"P". hawkinsi*. Unlike many of Hawkins' models, his plesiosaurs offer little original insight into their anatomy or lifestyles, instead largely adhering to templates of plesiosaur restoration already well-established by the mid-19th century. As some of the smallest reptile sculptures at the park, they are overshadowed by their neighbours, not least by the adjacent enormous ichthyosaurs. Original plans for more dynamic plesiosaur sculptures, including two fighting individuals, may have made them more notable.

Contrastingly, the Crystal Palace *Megalosaurus* has become an icon of 19th century palaeoart. Informed by very fragmentary remains, Hawkins imagined a 12 m long quadruped with the features of a crocodylian, bear and elephant. Choices in anatomical depiction and post-unveiling press interactions show that Hawkins conceptualised the *Megalosaurus* largely or entirely without assistance from Richard Owen, the ostensible but actually uncommitted palaeontological consultant for Hawkins' project. Despite its unorthodox appearance, Hawkins' *Megalosaurus* represented a major step forward in scientific accuracy from the earliest artistic interpretations of dinosaurs.

New fossil discoveries, especially from North America, rapidly dated Hawkins' *Megalosaurus* however, and gave palaeoart critics sufficient cause to largely suppress novel reconstructions of prehistoric animals until the 1880s. Argued as a means to prevent miseducation, this move only embedded the inaccurate Crystal Palace *Megalosaurus* in public consciousness further. Both Hawkins' sculpture and a second Crystal Palace *Megalosaurus* reconstruction, a part-life, part-skeletal restoration published in the official guidebook, were the most up-to-date artworks to reference for almost 30 years. As his career waned in the late 1800s, Hawkins attempted to integrate his original *Megalosaurus* concept with new theropod fossil data in his 1877 oil painting *Jurassic Life of Europe.* The result was of limited success and no known influence. *Megalosaurs* were soon to be eclipsed in the "canon" of mainstream prehistoric animals, too. Future theropod stars would be American taxa known from complete skeletons: *Allosaurus*, *Ceratosaurus* and, of course, *Tyrannosaurus*.

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Mark P. Witton

Mark is a palaeontologist and palaeoartist based at the University of Portsmouth. He is known for his research on pterosaur biology and the science of reconstructing fossil animal life appearance, topics on which he has published a number of technical papers and books.

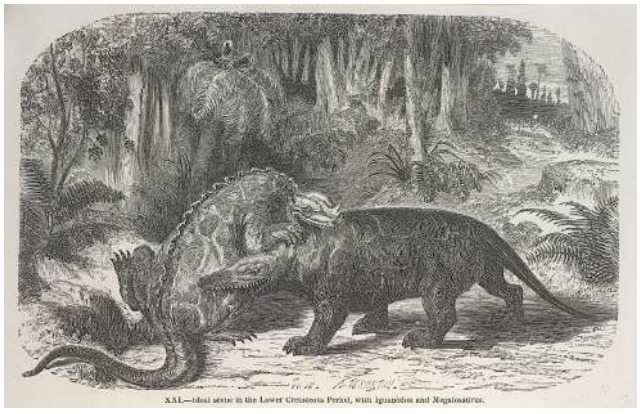
He is a project partner with the Friends of Crystal Palace Dinosaurs (https://cpdinosaurs.org/), the registered charity that works to document, research and preserve the Crystal Palace Dinosaur site in Penge, southeast London.

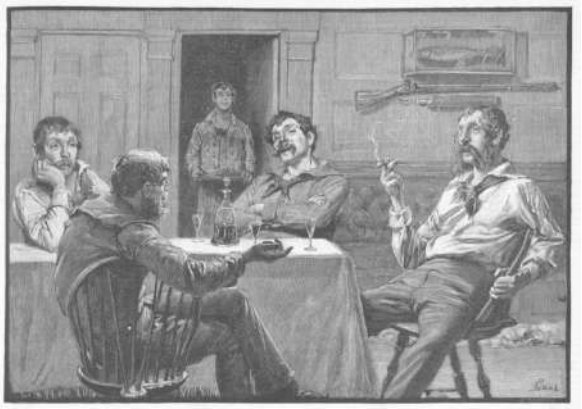
4.3 The Evolution of the Fictional *Megalosaurus*,1836–1912

Richard Fallon

University of Nottingham and the Natural History Museum

Richard.Fallon@nottingham.ac.uk





Left image: *Megalosaurus* vs *Iguanaodon* in *World before the Deluge* (1865 4th edition) by Louis Figuier (1819–1894), drawn by Édouard Riou (1833–1900)

Right image: 'The gentlemanly protagonists of *A Strange Manuscript Found in a Copper Cylinder* discuss the possibility that a gigantic reptile described in the titular manuscript could be a *Megalosaurus'.* Illustration by Gilbert Gaul from a serial installment of James De Mille's *A Strange Manuscript Found in a Copper Cylinder*, in *Harper's Weekly*, 32 (1888), 185–187. (185)

In Arthur Conan Doyle's adventure novel *The Lost World* (1912), *Megalosaurus* threatens human supremacy on the titular South American plateau; this threat is ameliorated by the same dinosaur's co-extensive role as epitome of the outmoded evolutionary model of brawn over brains. Doyle's memorable megalosaur (also called an allosaur) fossilized into countless other deadly-but-brain-dead dinosaurs in the fiction of subsequent decades. In the previous century, however, the literary function of William Buckland's gigantic saurian was more malleable. Building upon the rich scholarship on palaeontology in nineteenth-century literature, this paper tracks both famous and overlooked instances of the premier predatory dinosaur's appearances in fiction. Among other topics, it examines how *Megalosaurus* acted as both relic of an inferior past and unexpected admonisher of humanity's frailties.

In the decades following its 1824 description, the imagined *Megalosaurus* emerged with necromantic connotations in narrative popular science and scientific nonfiction. Its name, despite lack of acclaim for Richard Owen's 1842 coinage of the term 'dinosaur', entered figurative usage: the most famous example appeared in the novel *Bleak House* (1852), written by Owen's friend Charles Dickens, where an allusion to *Megalosaurus* embodied, among other things, the atavism still to be found on London's streets. When prehistoric animals shuffled into the plots of fiction in subsequent decades, the apex predator of mid-Victorian palaeontology provided an apt dramatic antagonist – and also something more complex – in dystopian romances like James De Mille's *A Strange Manuscript Found in a Copper Cylinder* (written 1860s; published 1888) and Edward Bulwer-Lytton's *The Coming Race* (1871).

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Richard Fallon

Richard is Postdoctoral KE Fellow at the University of Nottingham and Postdoctoral Researcher at the Natural History Museum. He is a scholar of nineteenth- and early twentieth-century literature and science, and his first monograph, *Reimagining Dinosaurs in Late Victorian and Edwardian Literature*, was published by Cambridge University Press in 2021. His forthcoming second monograph combines methods from literary studies and history of science to analyse fringe or 'borderline' areas of geology and palaeontology, including creationism, hollow-earth theory, and the study of Atlantis.

NOTES

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