OXFORD UNIVERSITY MUSEUM OF NATURAL HISTORY

Annual Review

2016-2017

Museum of Natural History

The Oxford University Museum of
Natural History Annual Review 2016–17
was edited from reports supplied by heads of
Collections, Sections and Research Units.

Based on an original design concept by Claire Venables
at Giraffe Corner Limited and produced by Oxford
University Brand & Design.

Photographs are by members of the
Museum staff unless stated otherwise.

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Contents

Oxford University Museum of Natural History

1600s Tradescant Collection formed

1677 Ashmole cabinet arrives in Oxford

1860 Museum of Natural History opens

2017 Most-visited non-national UK science museum

Second most-visited University museum globally

7 million objects

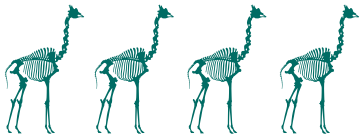
zoological type specimens 30,000

8,167 specimen loans made annually

500 active volunteers

£3.4 million operating budget

713,701 visitors a year



3,385 students visits

0.85 million web visits

364 events

117 for families

42 museum staff full time equivalent

www.oum.ox.ac.uk

Director's Introduction

One measure of any museum's performance is the number of visitors coming through doors. On that basis alone, the year to 31 July 2017 was a roaring success: annual visitor numbers topped 700,000 for the first time, rising 36,000 over the previous year.

A number of initiatives likely contributed to this rise. The first instalment of a joint marketing campaign for the University's Gardens, Libraries and Museums, dubbed 'Mindgrowing', was launched in the spring of 2017, targeting tourists and daytrippers with advertising in Oxford and London.

Another draw to the Museum was undoubtedly the successful programme we ran during 2016 under the Visions of Nature banner. As part of this themed year, the Museum hosted two art-science exhibitions and three poets-in-residence who contributed to a number of poetry events, and ultimately published an anthology of new poems edited by Professor John Holmes.

The two Visions of Nature exhibitions included Kurt Jackson's Bees (and the Odd Wasp) in My Bonnet, which brought together the contemporary artist's multimedia work on bees with British bee specimens from the collections, and Microsculpture: The Insect Photography of Levon Biss, a unique showcase of specimens from the Museum's entomology collections. Microsculpture reached 450,000 people during its eight-month run in Oxford, was the subject of a TED Talk by Biss, and has subsequently toured venues around the world.

Moving into 2017, our exhibition programme returned to the now-established Contemporary Science and Society series with Brain Diaries: Modern Neuroscience in Action. Working in collaboration with researchers at Oxford Neuroscience, Brain Diaries charted the fascinating changes that take place in the healthy brain from pre-birth to old age. We were delighted that the exhibition went on to win a Building Capacity award at the 2017 Vice Chancellor's Public Engagement with Research Awards; this was a strong sign of the success of the Contemporary Science and Society series in bringing academic research to the Museum's large and varied audiences.

The ongoing work of collections care and management saw the relocation of around 13,000 objects and specimens to a newly available storage space beneath the Radcliffe Science Library. Orchestrating such a complex move on time and on budget is no mean feat, so all credit to the staff team involved.

Many of the specimens in our collections remain offsite and are perhaps seldom seen, but there was one little creature which received a rock star profile this year. A bright pink-clawed pistol shrimp, discovered on the Pacific coast of Panama, made headlines around the world after one of our researchers and his colleagues named it after their favourite rock band. *Synalpheus pinkfloydi* was described in the journal Zootaxa in April, spawning unlikely tributes on T-shirts, cartoon strips, and even a new beer.

Returning to those record-breaking visitor numbers, our Operations team began to look at ways of improving the all-important visitor welcome and experience, while at the same time supporting the financial wellbeing of the Museum by exploring approaches for encouraging donations that help fund our many and varied activities.

Professor Paul Smith
Director

Highlights

Visitor Numbers

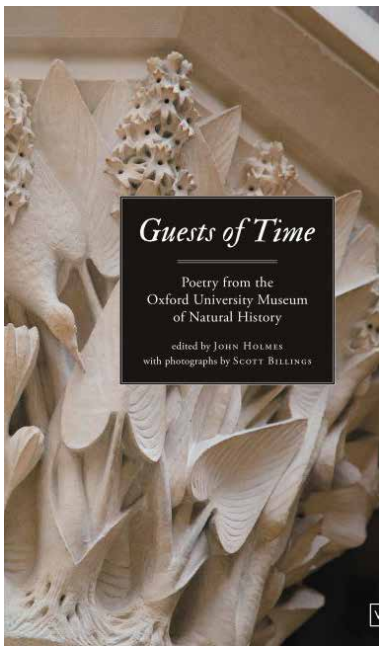
The Museum recorded its first ever year when visitor numbers were above 700,000. In the academic year to 31 July 2017, the Museum welcomed 713,701 visitors. This was a leap of 36,000 visitors on the previous year.

Right: Visitors to the Museum

Visions of Nature

The Visions of Nature year came to an end in December. As part of the series, the Museum had played host to three poets in residence who gained inspiration for their writing by spending time behind the scenes with scientists engaged in research into the collections. An anthology of the resulting poetry, *Guests of Time*, was published. The book was illustrated with original images from across the Museum.

Microsculpture, the Visions of Nature exhibition of macrophotography of specimens from the Museum's entomology collection, reached 450,000 visitors during its eight-month run and was the subject of a TED Talk in April with the Museum's collaborator and photographer Levon Biss. The exhibition is expected to tour across the world, ensuring that the images of the Museum's collections reach far beyond the visitors to the Museum in Oxford.



Right: Cover of Guest of Time poetry anthology

Far right: The Microsculpture exhibition in the Museum's main court

Brain Diaries

How do our brains work? How do we learn? Can my brain rewire itself? These were all questions posed by the Brain Diaries exhibition which opened in March during Brain Awareness week. Developed in partnership with Oxford Neuroscience, the exhibition charted the fascinating changes that take place in the healthy brain from pre-birth to old age.

The exhibition enabled researchers from Neurosciences to work with other brain scientists in Oxford and gave them the opportunity to tap into the Museum's public engagement experience. The Public Engagement team organised a programme of events which involved over 150 research scientists from four University departments and enabled visitors to contribute to new ideas for brain investigators.

Brain Diaries reached an audience of more than 45,000 people in its first two months of opening and the project won a Building Capacity award at the 2017 Vice Chancellor's Public Engagement with Research Awards. Additionally, a digital exhibition was developed at **www.braindiaries.org** to allow people to experience the exhibition. This led to Brain Diaries being named runner-up in IT Services's OxTalent Award which celebrates the use of technology in public engagement activity. The website will provide a lasting legacy of the exhibition.

Far left: Audience interaction with Brain Diaries

Left: Some of the Museum's brain specimens on display in the Brain Diaries exhibition

African Moths Photography Project

In May, the Museum's Image Technician Katherine Child produced a stunning report for the Street Foundation which has been supporting the African Moths photography project. The aim of the project is to produce high quality images of approximately 2,000 African moths from the Hope Entomological collections. The photos will be made publicly accessible via the African Moths website for the purpose of aiding the identification of around 1,000 different species of African moth. The project's photographs are exquisite and the detail allows them to be studied.

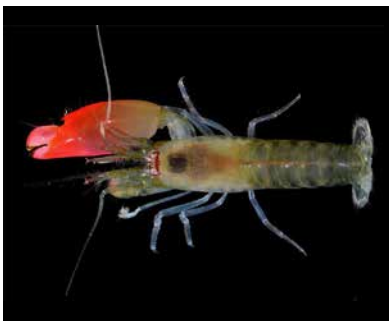
Following on from the publication of the report, the Street Foundation provided a further £20,000 to extend the duration of the project. It is estimated that there are over 1,000 individual specimens still to be photographed and this grant will enable the Museum to add more of these specimens to the existing digital collection. **www.africanmoths.com**

Left: A few of the images which have been taken for the AfroMoths Project, which aims to aid the identification of thousands of moth species. Around the outside, clockwise from top left: *Decachorda rosea; Thaumetopoea apologetica; Argema mimosae; Paralacydes arborifera; Rhodometra plectaria; Ceryx longipes*

Synalpheus pinkfloydi

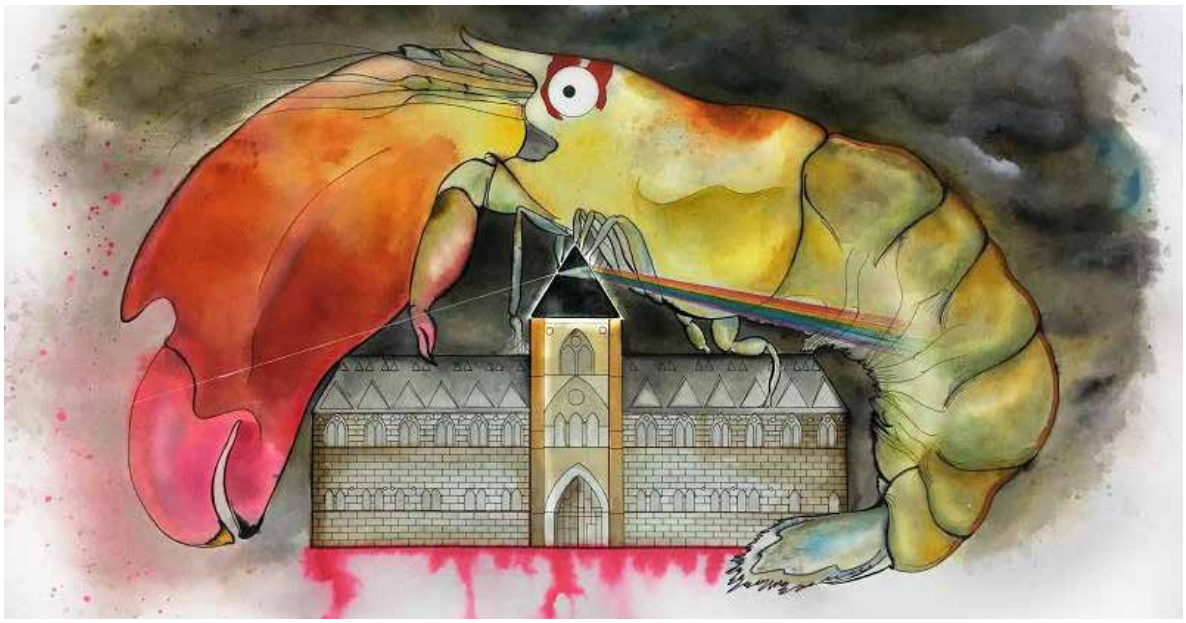
A bright pink-clawed species of pistol shrimp, discovered on the Pacific coast of Panama, made the news when it was given the ultimate rock and roll name in recognition of the discoverers' favourite rock band. Museum Head of Research Sammy De Grave was one of the authors who named the shrimp *Synalpheus pinkfloydi* in the scientific description of the species published in the Zootaxa journal in April.

Pistol shrimps are able to generate sonic energy by closing their enlarged claw at rapid speed. The resulting sound is strong enough to stun or kill a small fish.



© Arthur Anker

Above: *Synalpheus pinkfloydi* male, from the Las Perlas Archipelago



© Kate Pocklington

Right: Cartoon inspired by artwork from Pink Floyd's Animals album

Move Project

In November, the final objects from the Museum's collections were successfully relocated from the Old Power Station (OPS) and Engineering Basement to a new store in the Radcliffe Science Library sub-basement. More than 60 van trips and over 13,000 specimens later, the Museum was the first of the University museums to inhabit this shared space since its use for the Bodleian Library's Special Collections.

Right: Some of the collections relocated to a new museum store

Polar Medal

Museum Director Paul Smith was awarded a Polar Medal in the 2017 New Year's Honours list in recognition of his 'outstanding achievement' in the field of Arctic research. As a geologist and palaeontologist with a focus on the earliest forms of animal life, Paul has over thirty years' experience of working in the high Arctic, particularly in Greenland and Svalbard. His more recent work has examined the environments in which the first animals evolved, 550 to 500 million years ago, during the Cambrian Explosion.

Commenting on the award, Paul said: "It has been a huge privilege to work in this remote, entrancingly beautiful but fragile part of the world, and it is a great honour to be recognised for this work through the award of the Polar Medal. The landscape of the far north has changed dramatically over the course of my research career and that rate of change is accelerating. The need for ongoing scientific study and understanding of the Arctic region is therefore ever more important."

Professor Jane Francis, Director of the British Antarctic Survey and a member of the Museum's Board of Visitors, received a Damehood at the same investiture ceremony in May.

Left: Director Paul Smith with Professor Dame Jane Francis from the Board of Visitors receiving their awards

Visitor Giving Project

November saw the start of the visitor giving project at the Museum. Working with colleagues from the Science Museum Group, the Operations team considered how it can improve the overall welcome Museum visitors receive and investigated different methods for encouraging donations to help fund additional Museum activity.

Left: The Museum's main donation box

Public Engagement and Education

Story Makers

Right: School engagement during the Story Makers project

September saw the start of the Story Makers project between the Museum, Fusion Arts, and Integrative Arts Psychotherapist, Helen Edwards. During the project, three groups of 7 to 11-year-old children from Rose Hill, Wood Farm, and New Marston Primary Schools (all within Government areas of high levels of multiple deprivation) visited the Museum twice as part of an after-school provision to inspire work aimed at developing the capacity to think reflectively and dialogically, leading to the natural enrichment of speech and language.

The first Museum visits focused on exploring mineralogical and geological processes and specimens. The children used these as inspiration to develop descriptive language. The second visits took place in early November when children investigated animal skeletons, skin, muscle and movement with a focus on what, why and how animals communicate. Each group then worked on these themes back in their schools, culminating in an exhibition of their work in the new Community Case in the Museum. The Story Makers project was funded by Children in Need.

Hopes and Fears

Right: Still from the Lux Muralis light show with specimen bottles projected onto the Museum's facade

On 18 November, to launch Oxford's 'Being Human' festival, the Museum opened its doors to 1,400 visitors for a late night event with activities, debates and talks linked to the year's theme of 'Hopes and Fears'. The event was run in partnership with the Pitt Rivers Museum (PRM), Lux Muralis, Fusion Arts, Museum café Mortons, the three poets in residence and 20 researchers from institutions across Britain.

Lux Muralis and Fusion Arts provided a stunning light show projected onto the front of the museum featuring images and sound from MNH's and the PRM's collections. Visitors enjoyed drinks at the 'Hops and Beers' bar and could sample from a research menu by sitting in conversation with researchers and hearing directly from them about their work on subjects as diverse as: the information gleaned from palaeodiets; how and why scientists are retrieving DNA from dire wolves; and the scientific, historic and cultural values of the chickens of the world.

There were also opportunities for visitors to follow an 'Alice's Adventures in Extinction and Invasion' trail to explore specimens from the Alice's Adventures in Wonderland story which illustrate these themes, to listen to punk-folk songs about invasive grey squirrels, to chat about their hopes and fears, and to compose poetry.

Curious Curators

Left: Trying out learning activities during Curious Curators

November saw the first school groups take part in the Oxford University Museums Partnership (OUMP) funded project Curious Curators. Run jointly across the four museums, the project provided funding for four classes from local primary schools to take part in sessions aimed at enhancing analytical and communication skills.

The sessions introduced children to the concept that museums house specimens that can help people learn about the world and to do this effectively, museum staff consider the messages they want to get across to the public, as well as how the objects are presented and how visitors interpret and understand them using varied learning styles.

Using the Dodo as a model specimen, the children explored different learning activities, from puzzles to poems, plays and illustrations and discussed how effective each type of learning was. They were then given a popular specimen to find on display in the Museum and some facts to explore before returning to school to develop their own presentation using the learning styles and methods they decided would be effective in communicating these facts.

Education staff later took representative specimens into the schools when the children performed their presentations to fellow pupils and parents at a school assembly.

A Night at the Museum

November also saw the Youth Forum's first experience of running a special evening event for a teenage audience. The Forum devised fun activities and quizzes for the teenagers who had signed up for tickets for the evening. People guessed which animals were in a nocturnal cave which they had created in the seminar room using taxidermy and animal sounds. Those who took part solved riddles to follow a trail around the Museum, travelling upstairs in the 'disco lift'. Youth Forum members confidently ran insect handling sessions and set up cockroach races.

Far Left: The Youth Forum running activities for their Night at the Museum audience

Left: The disco lift in use during the Youth Forum's Night at the Museum

Utahraptor Competition

Right: The *Utahraptor ostrommaysorum* model in its new home at the Oxford Children's Hospital

During the summer, the Museum ran an unusual competition to find a new residence for a four-metre-long model of *Utahraptor ostrommaysorum*. The dinosaur model had been hibernating in an off-site store for some time but following a collections reorganisation, staff needed to find a new place for it to live. The competition to rehome the dinosaur was fierce, with around 200 venues across the world vying to become the *Utahraptor's* new keeper helped by coverage in the local and national press.

A team at the Museum agreed that the *Utahraptor* should be given to the Oxford Children's Hospital. The bid to take in the Cretaceous creature came from a hospital employee who nominated the Hospital so that the dinosaur could amaze and inspire their young patients.

The model was installed in the main entrance of the Hospital, complete with new lighting, funded by the Oxford Radcliffe Hospitals Charitable Funds. The Hospital team plan to develop new arts projects for young patients, themed around the dinosaur.

Christmas Science Lectures

During the first two weeks of December more than 1,100 pupils from secondary schools in Oxfordshire, Buckinghamshire, Berkshire, Wiltshire, Herefordshire, Northamptonshire, Gloucestershire and West London visited the Museum for Christmas science lectures for Year 9 students and A-level study days. Activities included short talks, competitions and hands-on activities covering a broad range of themes. The Museum was supported by research scientists from the Department of Earth Sciences, the Department of Plant Sciences, the Sir William Dunn School of Pathology, Nuffield Laboratory of Ophthalmology, Oxford Brookes Department of Biological and Medical Sciences, the Department of Biochemistry, the Department of Computer Science, the Department of Chemistry, the Department of Oncology and the Mathematical Institute.

Investigators

At the beginning of January, a new group of Investigators, aged between 14 and 16 years, started their projects in the Museum. Each Investigator chose or suggested a question to investigate, for example: what people can learn about flight from animals. Each member of the group designed and carried out experiments with specimens to work towards a silver CREST award. The award recognises creativity and the ability to solve problems alongside other scientific skills.

Right: One of the Investigators working on their project

Giant Chicken

Left:
The giant chicken dominating the main court

The Public Engagement team experienced a flurry of feathers during February half-term, as families celebrated all things chicken. All family activities were inspired by a giant chicken skeleton which towered over the *Tyrannosaurus rex* in the main court. The giant model had been created by secondary school students from the City of London Academy.

Activities included an egg matching game, where families had to match eggs to the birds that laid them. Many were astonished to find out how large a kiwi bird's egg is and were fooled into mistaking chocolate eggs for actual bird eggs. Families also got the opportunity to meet real farmers from FarmAbility, a day-service for adults with autism and learning disabilities based at Wytham Farm. Families learned about the process for getting the egg from the chicken onto the breakfast plate and took part in egg-packing races.

Oxford Swift City

The Museum was pleased to be a partner in Oxford Swift City, a major new initiative to protect and nurture the city's important swift population. The project hopes to turn the birds' fortunes around by identifying and protecting all existing swift nesting sites within the city ring road as well as encouraging the creation of new ones. Funded by the Heritage Lottery Fund, the RSPB-led scheme was supported by several local partners including Oxford University, Oxford City Council, Thames Valley Environmental Records Centre, Environment Resources Management and the local Wildlife Trust. The Museum will be developing and delivering the schools education strand of the project.

Above: Swifts over the Museum tower

Right: The Museum's partners at the launch of Swift City

Great Debate

Right: The Great Debate panel

The anniversary of the Great Debate fell in June and the Museum reignited the tradition of a lively and controversial discussion with The Great Debate: Smart Drugs – Is It Cheating? Claire Fox, of the Institute of Ideas and BBC Radio 4, chaired a multidisciplinary panel in a debate about the ethics, fairness, and effects of so-called smart drugs and their impact on society. The panel for the debate included world experts in the fields of neuro-ethics, evolutionary psychology, and philosophy, each representing different sides of the argument in this challenging subject.

New Blog Series: Is it Real?

Collections and Research staff embarked on a new blog mini-series called Is It Real? The series, published in a frequently asked questions format, looked at different types of natural history specimens in turn, asking reality-check questions such as 'Is it a real animal?', 'Is it a model?' as well as explaining how the Museum's taxidermy specimens are created.

Right: The Oxford Dodo skull being examined as part of the Is it real? blog series

Research

Darwin's Fuegian Lice Project

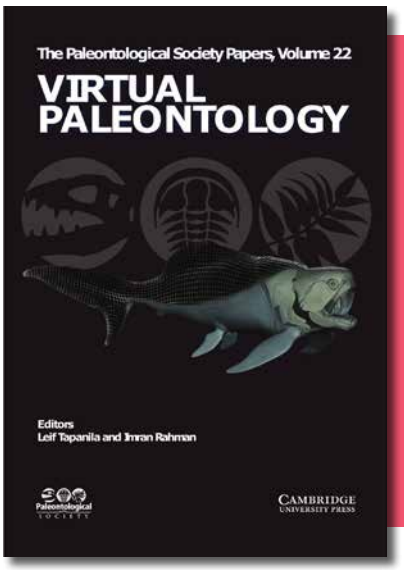
Funded by the Biotechnology and Biological Sciences Research Council (BBSRC), Post-Doctoral Researcher Charlotte Inchley started work with the Alfred Denny lice collection, a collection which has been untouched since its arrival at the Museum in 1871. After the curation and identification of the 3,000 specimens, it is hoped the human lice (including from now-extinct South American tribes) within the collection will help to reconstruct the peopling of South America, and the transfer of lice from primates to humans and vice versa, as well as the dates at which the various lice groups split evolutionarily.

Left: One of the lice Darwin collected in South America from the Museum collection

Workshop on Advanced Techniques for Palaeobiology

Together with colleagues from the Universities of Bristol and Cambridge, Imran Rahman ran a Workshop on 'Advanced Techniques for Palaeobiology' in November. The workshop was held at the Nanjing Institute of Geology and Paleontology, Chinese Academy of Sciences, in Nanjing, China, and was attended by around 100 palaeontologists from all over the country. Dr Rahman gave a demonstration of the computer program SPIERS, the free software for visualizing tomographic datasets. In addition, Imran spoke about computational fluid dynamics and COMSOL commercial simulation software.

Left: The workshop on Advanced Techniques for Palaeobiology in Nanjing, China



Virtual Palaeontology

Imran Rahman co-edited a special volume on Virtual Palaeontology (together with Dr Leif Tapanila, Director of the Idaho Museum of Natural History) published by the Paleontological Society and Cambridge University Press. The volume brought together a collection of 11 papers on methods for digitally visualising and analysing fossils in 3D. These include contributions on X-ray computed tomography, confocal microscopy, laser scanning, digital data repositories, and the use of 'virtual fossils' in outreach. The volume is the product of a Short Course sponsored by the Paleontological Society that was held in Denver, USA, in September.

Left: The special volume co-edited by staff from the Museum

Post-fossilisation process

Right: Ediacaran fossils from the Mistaken Point UNESCO World Heritage Site, Newfoundland

Museum Researcher Jack Matthews co-authored a paper published by the Geological Society of London, about post-fossilisation processes including metamorphism, exhumation, weathering, erosion, and even the time, manner, and conditions in which the fossil is recorded.

Cascolus ravitis

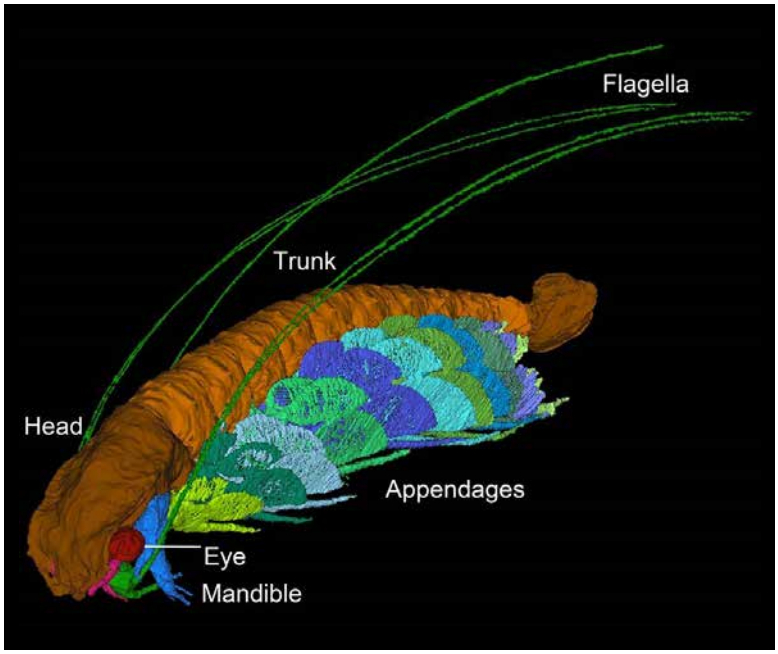
Right: Professor David Siveter, University of Leicester, Sir David Attenborough and Professor Derek Siveter, University of Oxford. Credit: University of Leicester

Museum Senior Research Fellow Derek Siveter and other members of the Herefordshire Lagerstätte research team published a paper the subject of which is a new fossil species dedicated to Sir David Attenborough. Other authors on the paper were David Siveter (University of Leicester), Derek Briggs (Yale University), Mark Sutton (Imperial College London) and David Legg (ex-OUMNH).

The newly discovered species is a crustacean and the fossil was found in a nodule, which prevented the animal from being compressed over time and preserved its body in the round. It was recovered by physical-optical tomography, with stitching together of the numerous digital images by computer software to form a 3D 'virtual fossil'. This process was undertaken at the Museum by Research Assistant Carolyn Lewis

The fossil was named for Sir David, to mark his 90th birthday and his connection with Leicester University. The name, *Cascolus ravitis* means 'a messenger of life from Leicester' - a recognition of Attenborough's distinguished career as a science and natural history broadcaster.

Right: The crustacean *Cascolus ravitis*. Siveter et al



Mysteries of the Deep

© Okeanos mission

Since 2008, the Okeanos Explorer at the National Oceanic and Atmospheric Administration in the US has been investigating deep water ecosystems using remotely operated vehicle (ROV) dives for scientists to observe. In 2016, Okeanos was engaged in an exploration of the Mariana Trench Marine National Monument in the Pacific Ocean and during a single dive at 4,826 metres a large shrimp was observed which scientists did not recognise.

This was an unexpected find. Although there are about 4,000 species of caridean shrimps in the world's oceans, few live below 1,000 metres, and fewer than 20 species are known from depths lower than 3,000 metres. Those that do are usually found as broken specimens, damaged by the trawls which bring them to the surface.

Photos of the shrimp were sent to experts including Sammy De Grave, Head of Research at the Museum. He recognised the specimen as belonging to the rare genus *Bathystylodactylus*, which comprises only three scientifically-described species, which in turn are only known from six specimens, all damaged.

Left: *Bathystylodactylus cf bathyalis* filter-feeding. Reproduced thanks to the Okeanos Mission

Cork Workshop on Exceptionally Preserved Fossils

Two Museum researchers, Duncan Murdock and Imran Rahman, were invited speakers at the International Workshop on Konservat-Lagerstätten, which was held in Cork, Ireland in July. The two-day meeting brought together scientists from across the world to discuss their research on Konservat-Lagerstätten – sites of exceptional fossils - including specimens preserving soft parts of animals and plants. Dr Murdock gave a presentation on how to design decay experiments to understand what happens to animals after they die, and how they can become fossils. Dr Rahman spoke about CT scanning and how this can be applied to the study of exceptionally preserved fossils.

Left: Museum staff presenting during the Cork workshop on Exceptionally Preserved Fossils

Eusaurosphargis dalsassoi

Research Fellow James Neenan was involved with the discovery and description, of an armoured reptile from the Middle Triassic named *Eusaurosphargis dalsassoi*. A beautifully-preserved fossil found in the Alps in eastern Switzerland revealed more about this animal. The findings about its anatomy and probable lifestyle were unexpected, according to a paper published in *Scientific Reports*, led by Dr Torsten Scheyer at the University of Zurich and co-authored by Dr Neenan.

"Until this new discovery we thought that *Eusaurosphargis* was aquatic, so we were astonished to discover that the skeleton shows adaptations to life on the land. We think this particular animal must have washed into the sea from somewhere like a beach, where it sank to the sea floor, was buried and finally fossilised."

© Dr Torsten Scheyer

© Beat Scheffold

Far left: Fossil specimen of *Eusaurosphargis dalsassoi* PIMUZ A/III 4380

Left: Life reconstruction of *Eusaurosphargis dalsassoi* based on new specimen PIMUZ A/III 4380

Collections

SUNDASIA Project Visiting Researcher

Right: A SUNDASIA project excavation in progress in Hang Moi, an archaeological cave site in the Trang An World Heritage Area, North Vietnam

Dr Christopher Stimpson, Queen's University Belfast, was based in the zoology collections for three months using them to undertake comparative work with zooarchaeological material excavated from Vietnam as part of the SUNDASIA project. The multi-disciplinary SUNDASIA research project is focused on the archaeological, geological and ecological history of the Tràng An massif World Heritage site, Ninh Bình inVietnam. In September, Head of Life Collections Darren Mann visited Vietnam to look at the insect ecologies of the area as part of the project.

Earth Collections Acquisitions

Right: Fossil catfish *(Astephus antiquus)* from the Eocene Green River Formation of Lincoln County, Wyoming from the Tony Holmes collection

In August, Earth Collections acquired a fossil collection built up by Jim Bryant, a highly-respected amateur geologist. Jim had been a member of some of the major geological societies in the UK and in 2006 was awarded the Geological Society's R.H. Worth prize for the encouragement of amateur geology. His collection contains around 10,000 specimens, mainly from the Mesozoic and Cenozoic eras, and significantly enhances the Museum's existing collections.

In September, Dr John Wright of Royal Holloway presented the final part of his collection, comprising around 250 Middle-Upper Jurassic ammonites from Wiltshire, Dorset and Staffin in Scotland, as well as material of a similar age from France, Italy, Poland and Russia. The collections contain over 40 published specimens, and includes many rarities, including the only example of Decipia from the Sandsfoot Clay (Oxfordian, Upper Jurassic).

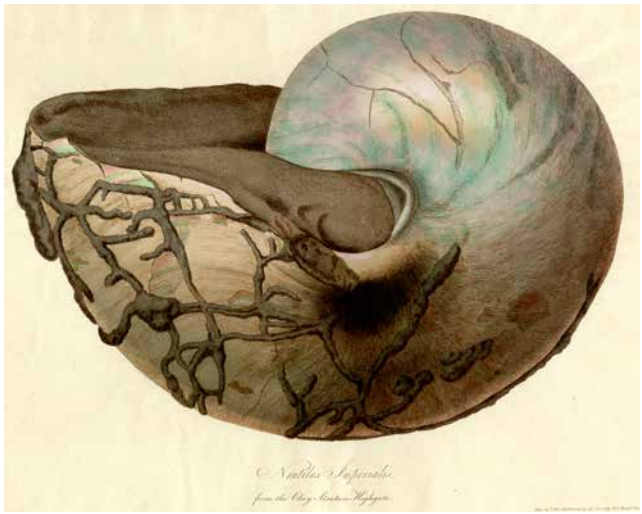
At the beginning of March, Tony Holmes presented around 350 fossil specimens, including vertebrate remains from the Upper Triassic of Aust, Bristol and a fossil catfish *(Astephus antiquus)* from the Eocene Green River Formation of Lincoln County, Wyoming.

Cataloguing Art

Right: *Nautilus imperialis* print from 1812

The Museum is home to a substantial collection of art and objects. This material became the focus of two students, Charlie Baker and Imogen Stead, as part of an E.P. Abraham Cephalosporin internship project who spent six weeks researching, organising and curating it for the Museum. The team managed to bring together numerous prints, paintings, photographs and sculptures into a single organised collection.

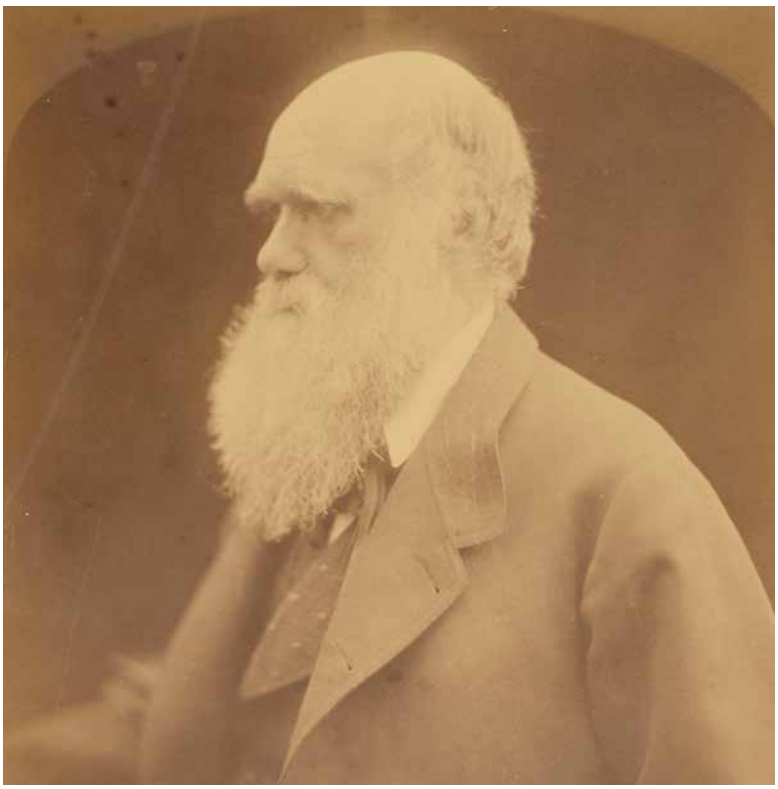
One of the items catalogued was a stunning print from 1812 showing a fossil of the *Nautilus imperialis*. The small pamphlet of text attached suggests that the print was promotional material for James Sowerby's *Mineral Conchology of Great Britain*, the first volume of which was published in 1812.



Photography from the Archives

The November Presenting… case display showcased pioneers of photography and featured a newly-discovered original print of Charles Darwin by Julia Margaret Cameron. In the mid-19th century, several photographic innovators had close links to the Museum and its collections. Perhaps the most famous of these is Charles Lutwidge Dodgson (1832-1898), better known as Lewis Carroll. One of Dodgson's subjects was an accomplished photographer, and one of the most famous female photographers of her time, Julia Margaret Cameron (1815-1879).

Many prominent scientists sat for Cameron, including naturalist Charles Darwin. In 1868 she took a portrait of Darwin at her home on the Isle of Wight and an original print of this photograph was recently discovered in the Museum archive, uncatalogued. The print features her signature on the back and the blind stamp from her print seller in London on the front. It is believed this was Darwin's favourite portrait as many copies feature a caption by Darwin: "I like this photograph very much better than any other which has been taken of me."



Left: Portrait of Charles Darwin by Julia Margaret Cameron

Databasing the Human Remains Collections

Kathryn Krakowska, a specialist on the forensic pathology of human remains, joined the Museum on an Oxford University John Fell funded project for seven months to identify the pathologies and research the history of the historic collections of human remains specimens.

Dr Krakowska created a detailed database of the collection which was started in the first half of the 18th century and passed to Dr Henry Acland, founder of the Museum. Acland added to the collection, acquiring his own samples as well as purchasing specimens and collections from physicians. The collection continued to develop through the 19th century growing to contain over 1,400 specimens. It is one of the few collections from the period still in existence in Britain.

As a specialist in human osteology, Dr Krakowska assessed the remains for such characteristics as sex, age-at-death, and pathologies or trauma that the individual was affected by. The Museum's collection revealed specimens that provide evidence about health and medicine in Oxford in the 18th and 19th centuries. Many were used to teach medicine, so different skeletal pathologies are represented, including bacterial infections, genetic deformities, nutritional deficiencies, and traumatic injuries.

The collection was fully catalogued and digitised, and it is hoped that further research may help shed light on historical pathologies and the development of medicine as a discipline.

Left: OUMNH-ZC-022019 Cast of human cranium from the human remains collection

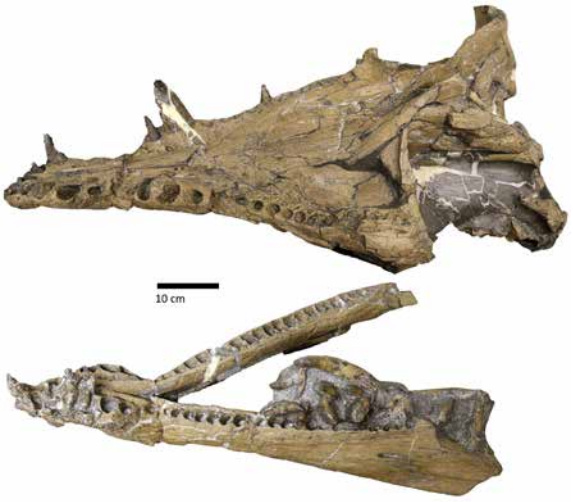
Bee Identification Workshop

The Museum hosted a two-day bee identification workshop led by expert tutor Steven Falk. The course was the largest the Museum has run to date with over 20 participants. To complement the teaching, Collections staff provided tours, open access to reference material and stayed on hand to answer enquiries on specimen preparation and collections maintenance. Feedback from the session was positive and included requests for further courses that the Museum might host.

Right: Attendees at the Museum's bee identification workshop with tutor Steven Falk

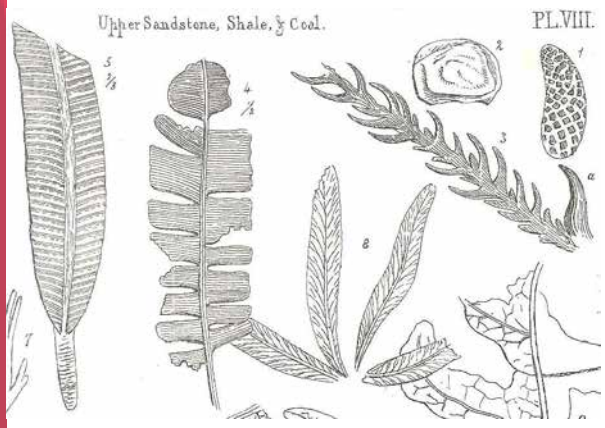
New Jurassic Pliosaur Skull

In October, Earth Collections acquired a new Jurassic pliosaur skull from the Oxford Clay Formation of Peterborough. The specimen probably belongs to the rare species *Simolestes vorax* but may turn out to be a new species. It was found inside a large and incredibly hard Septarian concretion, which took nearly 500 hours to prepare. The skull is beautifully preserved, with all the cranial sutures visible, making it an excellent research and display specimen and it significantly enhances the Museum's collection of Jurassic marine reptiles.



Right: New Jurassic pliosaur skull from the Oxford Clay Formation of Peterborough

Rediscovery of Lost Fossil Type



Right: Plate 8, of John Phillips's *Illustrations of the Geology of Yorkshire* (1829) showing the *Scolopendrium solitarium* specimen (figure 5)

An enquiry from Professor Han van Konijnenburg of the Naturalis Biodiversity Center in Leiden, the Netherlands, led to the discovery of what may be the lost holotype of the Middle Jurassic plant *Scolopendrium solitarium*. The specimen was collected by John Phillips from the Inferior Oolite of Gristhorpe Bay, Yorkshire, and was figured as plate 8, figure 5 of his *Illustrations of the Geology of Yorkshire* (1829). Collections staff sent Professor van Konijnenburg images of several possible specimens, which enabled her to say she was 99% certain that the fossil described and figured by Phillips is specimen OUMNH J.29628.

University Teaching

Michaelmas is a busy term for teaching using the zoology collections. Collections Manager Mark Carnall introduced a new organisms practical for Biological Sciences students, as well as a new taught session and a new practical on principles of zooarchaeology and human osteology for MSc Archaeological Sciences, and three new tutorial sessions for Biological Sciences students on bird collections, extinction, and scientific description. In addition, there were practical sessions on fish and herpetology osteology for Earth Sciences third-year undergraduates and a session on vertebrate osteology for first-year Biological Sciences students.

Teaching using the Museum collections is largely oriented around Archaeology, Earth Sciences and Biology, however, the Museum is always looking for more opportunities to use the collections for teaching students across the University.

Left: Zoology specimens used in teaching

Flight of the Dodo

The January Presenting… case featured casts of the famous Oxford Dodo head from the zoology collections. Taking casts of the head, which were then sent to and exchanged with scientists and other museums from the 1820s onwards, was a master stroke in science dissemination that helped to build the status of the dodo as an icon for extinction. Incomplete records had been kept as to how many casts had been made and who they had been sent to so museums across the world were encouraged to contribute their dodo head casts to the blog post which was updated throughout the display. Several museums participated and a few discovered new information about the age and originality of their casts.

Left: A multitude of Dodo casts

Out of the Deep

Right: Artist's impression of 'Eve', a Jurassic plesiosaur. Illustration by Natalia Patkiewicz 2016

A generous donation of £89,000 from DCMS Wolfson will be used to conserve and exhibit two internationally significant fossil marine reptile skeletons found in the Oxford Clay beds: the Yarnton pliosaur and a long-necked plesiosaur from Peterborough. The aim of the project is to reinvigorate the exhibits in the main court by creating an engaging display that will tell the stories of the skeletons along with their discovery, significance and life underwater in the Jurassic period. The story featured on BBC South Today.

Sam Giles, a palaeontologist at the Department of Earth Sciences was also awarded a grant of £5,000 from the L'Oréal-UNESCO Ambassador fund. The grant will enable Sam to work with the Public Engagement team and Collections staff to create a set of palaeontologist explorer backpacks. The backpacks will have resources for primary-school aged children to engage with the Out of the Deep display, including anatomically accurate 3D printed plesiosaur jigsaws. The activities will focus on the work of female palaeontologists, including Sam, as well historical figures such as Mary Anning and Elizabeth Philpot.

Insect Taxonomy Course

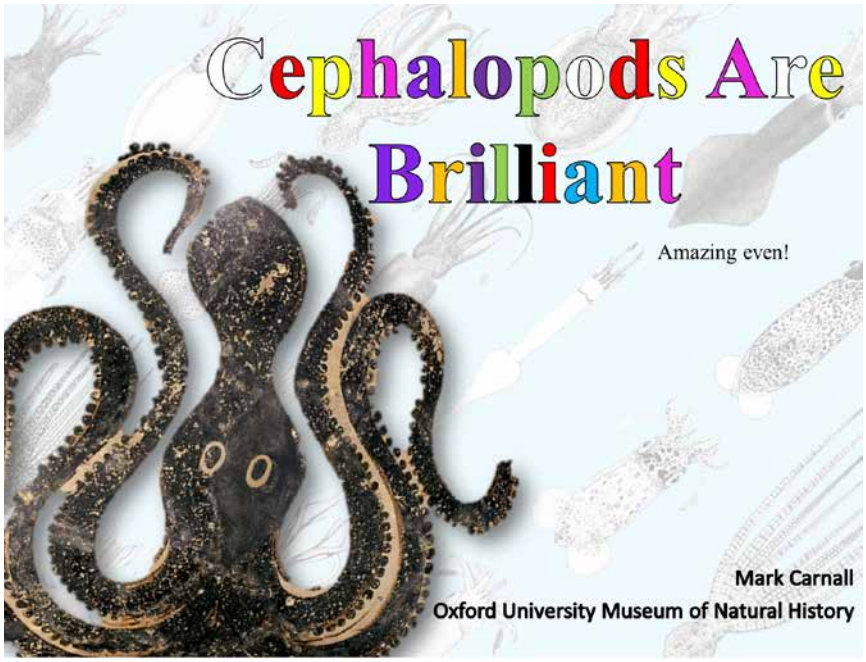
Right: John Ismay demonstrating how to get to those hard to reach insects

March saw the advent of the Insect Taxonomy and Field Sampling Skills Course run in conjunction with the Continuing Education Department of Oxford University. The week-long intensive course focuses on everything an entomology student needs to know from field collecting to identification skills. Keynote talks were given by Dr Richard Comont of the Bumble Conservation Trust and Honorary Associate John Ismay helped lead the fieldwork sessions. The majority of participants were doctoral students or early career starters in wildlife conservancy work.

Partnerships

OUMNH represented at Ashmolean Live Friday: Under the Sea

Mark Carnall gave a talk at Ashmolean Live Friday in September alongside colleagues from Medieval and Modern Languages and the Environmental Change Institute. The talk, called Cephalopods are Brilliant, was a whistle-stop tour through the many ways that cephalopods are amazing from the correct pluralisation of octopuses, the free and easy insertion places of spermatophores in squid, through to how to identify if your dinner is calamari or not.



Left: The Cephalopods are Brilliant presentation from Ashmolean Live Friday

'Illuminating Objects' at the Courtauld Gallery

Early in May, Monica Price was contacted by the Curator of Sculpture and Decorative Arts at the Courtauld Gallery in London about the possible loan of samples of Sicilian jasper for a temporary display at the Gallery. An interdisciplinary internship there called Illuminating Objects gives postgraduates from various disciplines outside of art history the chance to select an object from the collection of decorative arts and present it in the Gallery and online for three months. Intern Natasha Gertler, a graduate in physics who is studying for an MSc in Science Communication at Imperial College, selected a 17th century Italian pietre dure frame which is thought to be part of a travelling altar. Dr Ruth Siddall a decorative stone expert at University College, London, helped her to identify the polished stones using the Museum's Corsi decorative stone collection website.

Far left: Identifying stones in the frame using the Corsi website. Photo: Courtauld Gallery (by permission)

Left: Natasha Gertler exploring the Corsi collection in Oxford

Zoology Collections on Loan

During the year, several exhibition loans from the zoology collections came to fruition. A Galapagos finch and a mud crab collected by Charles Darwin went on loan to Palace Green Library in Durham University for their exhibition Time Machines! The Past, the Future, and How Stories Take us There. The exhibition, led by university researchers, looks at how advances in science helped to inspire writers like H.G. Wells to travel through time and space in fiction.

Specimens from the Tradescant Collection held by the Museum were loaned to the newly opened Garden Museum in London to be displayed in their Tradescant Ark gallery. Both the Tradescants and Elias Ashmole are buried on the site of the Garden Museum and the new gallery celebrates their contribution to botany, science and the history of collecting.

Right: Galapagos finch collected by Charles Darwin loaned to Palace Green Library, Durham University

Running the Museum

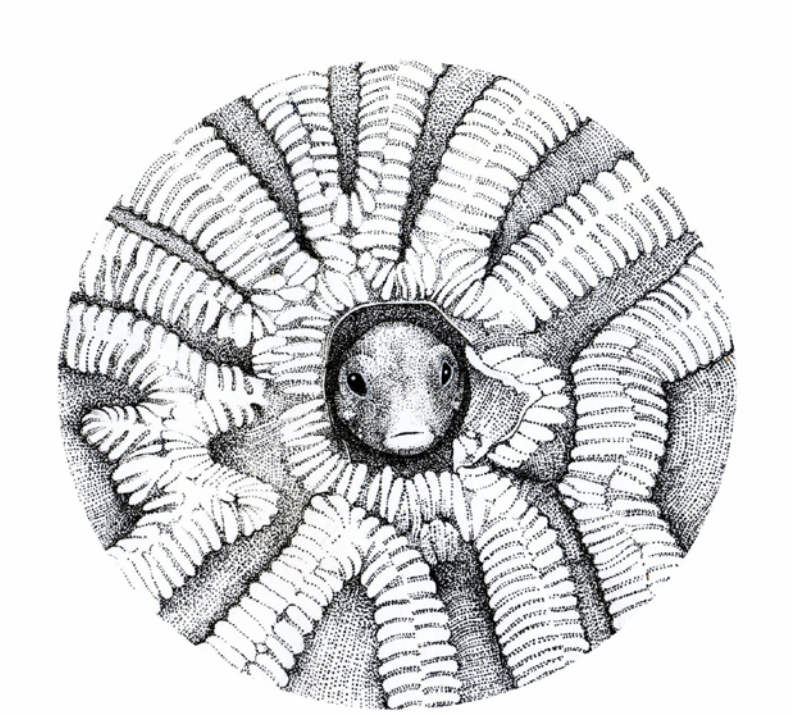
OUMNH internships and placements

The Museum welcomed six interns whose internships were generously supported by the E.P. Abraham Cephalosporin Fund. This programme is in honour of Sir Edward Penley Abraham (1913-1999), an Oxford biochemist instrumental in the development of the first antibiotics (penicillin and cephalosporin). The Museum has received funding to support this programme for the next three years.

From July 2017, Ana Pagu and Simon Allen catalogued teaching collections objects and specimens, Chloe Agar and Kristiina Joon mapped the collections displayed in the court. Chloe Rice worked on the Museum's Wytham Woods archives and specimens and Stephanie Wright worked on 3D scanning of marine reptiles and cataloguing Earth collections.

The Museum also hosted Hannah Sweetapple, a University of Leicester MA Museum Studies placement student for eight weeks. Hannah supported Public Engagement's family programming over the summer. Kathryn Schronk, BSc Conservation of Objects in Museums at Cardiff University, shadowed the Life Collections Conservator to learn about the conservation of collections specimens.

Additionally, the Museum hosted two illustration students from the University of Plymouth, Jade Broadhead and Sally Mullaney. As part of a module on interpreting information, the students were given information on current research in the Museum and asked to interpret this information visually.



Left: Illustrations inspired by the collections by the Plymouth BA Illustration students

Left: The Twilight Zone, illustration showing corals found on the reefs of Honduras by Jade Broadhead

Left: Charles Lyell geologising with Prince Albert on the River Dee in Balmoral by Sally Mullaney

Museum Roof

Work was carried out to install protective UV film on the Museum's glass roof tiles to reduce the amount of UV and visible light penetrating the space below. Scaffolding was erected on the roof and a large safety mesh at parapet level above each aisle. The work, funded by University Estates, was planned to minimise disruption to visitors and to the swifts which were already nesting in the tower when work commenced.

Teaching Room Refurbishment

The main teaching room within the Museum was refurbished with funding secured through Minor Works. With tougher, more easily-cleaned flooring and new pest-proof, sealed and internally-lit glass cases the specimens from the education handling collection can now be seen in better lit and better environmentally controlled locations.

Community Case

The first community case display was the work of the Story Makers team organised by education officers at the Museum. Story Makers, funded by Children in Need, is an arts initiative for Oxford primary school pupils, aimed at helping to develop their communications skills. Pupils worked with Integrative Arts Psychotherapist Helen Edwards and Oxford charity Fusion Arts, visiting the museum to find inspiration for their creative work which was then put on display in the special museum case.

Staff Changes

The Collections team welcomed Lily Barnes who joined the Museum on a six-month contract as Documentation Assistant. Lily Wilks, who had previously joined as a work placement while at Newcastle University, rejoined Earth Collections to work on the Charles Lyell Project.
Research welcomed Dr Jack Matthews who is also a postdoctoral research fellow at Memorial University of Newfoundland, carrying out research focusing on the Ediacaran rocks of Newfoundland. Dr Charlotte Inchley joined the Museum from the University of Cambridge as a Postdoctoral Researcher to work on the recuration and taxonomy of the Denny lice collection with funding from the BBSRC. Dr Duncan Murdock, Leverhulme Early Career Fellow, started at the Museum in January from the University of Leicester. His research involves using the fossil record to understand the early evolution of skeletons in animals. Vanessa Moore joined the Research Support team from the Royal Horticultural Society. Dr Ricardo Pérez-de la Fuente started at the Museum in July from Harvard University and researches the palaeobiology of fossil arthropods, namely insects and arachnids.
The Operations team welcomed Visitor Services Assistants Aishah Olubaji, Ceri Watkins, Kelley Swain, Matthew Holden, Michelle Alcock, and Rebecca Spencer,. The busy Museum shop welcomed shop assistants Abigail Barter and Natasha Dussold. Laura Ashby started at the Museum in February as Events Manager, Laura has previously worked in events at the Cheltenham Music Festival and the Museum of the History of Science.
The Museum said farewell and thank to the following team members during the year:
Operations: Abigail Motley, Julia Parker, Safora Bibi, Sian Burgess and Stuart Booker
Research: Dr Allison Daley moved to take up a permanent associate professorship at the University of Lausanne, Dr David Legg took up a research fellowship at the University of Manchester, and Professor Derek Siveter retired and was made an Honorary Associate of the Museum.
Collections: Jackie Chapman-Gray moved to a conservation role in the Pitt Rivers Museum following the end of her maternity leave cover in Life Collections.

Appendices

Appendix 1: Visitors of the Oxford University Museum of Natural History at 31 July 2017

The Vice-Chancellor Professor Louise Richardson AAAS AcSS FRSE RIIA

The Pro-Vice-Chancellor (Gardens, Libraries and Museums): Professor Anne Trefethen

Assessor: Dr Luke Pitcher

Carole Souter CBE (Chair)

Professor Christopher Ballentine

Professor Tim Coulson

Professor Philip England FRS

Professor Dame Jane Francis

Professor Charles Godfray CBE, FRS

Professor Alex Halliday FRS

Professor Gideon Henderson FRS

Professor Peter Holland FRS

Professor Jonathan Michie

Professor Alice Roberts

Dr Emily Scott-Dearing

Professor Ben Sheldon

Dr Laura Van Broekhoven

Professor Paul Smith (Secretary to the Board)

Appendix 2: People

Staff of the Museum 2016-17

Director: Professor Paul Smith

Museum Executive Assistant: Emma Thomas

Life Collections

Head of Life Collections: Darren Mann

Conservator: Bethany Palumbo, Jacqueline Chapman-Gray

Collections Managers: Mark Carnall, Dr James Hogan, Zoë Simmons, Amoret Spooner

Image Technician: Katherine Child

Move Project Manager: Hannah Allum

Earth Collections

Curator: Dr David Waters

Collections Manager: Eliza Howlett, Hilary Ketchum, Monica Price

Earth Sciences Conservator: Juliet Hay

Research

Head of Research: Dr Sammy De Grave

Senior Research Fellow: Professor Derek Siveter

Museum Research Fellows: Dr Allison Daley, Dr David Legg, Dr Jack Matthews, Dr Duncan Murdock, Dr Ricardo Pérez-de la Fuente, Dr Imran Rahman, Dr Sancia van der Meij

Post-doctoral Research Assistant: Dr Charlotte Inchley

Research Assistant: Dr Carolyn Lewis

Archives and Library

Head of Archive and Library: Kate Diston

Digital Collections Manager: Dr Sarah Joomun

Documentation Assistant: Lily Barnes

Information Technology

IT Officer: Sarah Phibbs, Dr Rosemary Painter

Public Engagement

Head of Public Engagement: Janet Stott

Digital Engagement Officer: Scott Billings

Education Officers: Chris Jarvis, Sarah Lloyd, Carly Smith-Huggins

Education Assistant: Jenny Hulmes

Education and Interpretation Officer: Rachel Parle

Exhibitions Officer: Ellena Grillo

Joint Museum Education Service

Head of Volunteers and Outreach: Joy Todd

Community Outreach Officers: Nicola Bird, Susan Griffiths

Administrative Assistant: Michalina Syzmanska

Volunteer and Outreach Assistant: Dr Caroline Moreau

Operations

Head of Operations: Wendy Shepherd

Events Manager: Laura Ashby

Accounts: Anne Atkinson, Beverly Judd

Cleaner: Gary Coates

Front of House Manager: Krista Baker

Visitor Services Assistants: Michelle Alcock, Jane Griffin, Rebecca Hogben, Matthew Holden, Navigator Ndhlovu, Aishah Olubaji, Rebecca Spencer, Kelley Swain, Ceri Watkins

Workshop and Maintenance: Peter Johnson, Adam Fisk

Retail Manager: Fitri Puspitasari

Shop Assistant: Abigail Barter, Natasha Dussold, Magdalena Molinari

Cross-Museums

Oxford University Museums Research Facilitator: Dr Harriet Warburton

Research Support Officer: Vanessa Moore

Head of Development: Fiona Gourley

Senior Development Executive: Heidi Kurtz

Development Officer: Catherine House

OUM Partnership (OUMP)

Head of OUM Partnership: Lucy Shaw

OUMP Officer: Jessica Suess

OUMP Assistant: Emma Henderson

Reminiscence Officer: Helen Fountain

Honorary Associates

Mr D. Michael Ackland

Mr John Cooter

Mr Guillaume de Rougemont

Mr Ray Gabriel

Mr Paul Gaat

Mr Richard Gallon
Professor John Holmes
Dr John W. Ismay
Dr Jeyaraney A. Kathirithamby
Dr Tom S. Kemp
Professor W. Jim Kennedy
Dr Stuart Longhorn
Dr George C. McGavin
Mrs Malgosia Nowak-Kemp
Mr Roy Overall
Dr Adrian C. Pont
Mr H. Philip Powell
Professor Derek Siveter
Mrs Sally-Ann Spence
Mr Chris A. O'Toole
Dr Kevin Tilbrook
Dr Yan Wong

Research Units

Environmental Archaeology Unit
Director: Professor Mark Robinson

Appendix 3: Finance

Grants Awarded and Donations Received

£89,355	**DCMS Wolfson Museums and Galleries Improvement Fund,** Out of the Deep
£3,000	**Dr Mortimer and Theresa Sackler Foundation,** Library scanner
£61,383	**EPA Cephalosporin Fund,** Contemporary Biomedical Science A-level adult DNA workshops and Three Year Internship Programme
£130,216	**EPA Cephalosporin Fund,** Bacterial World funding
£1,997	**Gus A. Carey,** Strategic funds
£5,000	**L'Oreal UK,** Jurassic Backpacks
$75,000	**Negaunee Foundation,** Annual project funding
£10,000	**Pearl Freeman,** Mineralogy
£20,000	**Street Foundation,** Afro Moths
£3,000	**Wellcome Trust,** Public engagement with research for animal welfare A-level sessions

The Museum is extremely grateful to the many individual donors, foundations and trusts who have generously contributed to its work in 2016/17.

£177,235 from IT Capital Fund for Collections Metadata Migration Project

Travel and research grants

£7,488 (J. Neenan and I. Rahman)	**John Fell Fund**
£41,396 (Entomology)	**NERC,** Insect taxonomy teaching

Appendix 4: People

New Acquisitions

Earth Collections

A total of 14 accession lots comprising around 11,000 specimens were received by donation to the collection.

Notable accessions donated during the year included:

- 1 specimen of Bridgesite (awaiting publication as new species) presented by Neil Hubbard on behalf of Mrs Shelagh Bridges
- 2 specimens of Bobkingite (including sample from type specimen) presented by Neil Hubbard
- A large fossil collection, mainly from the Cenozoic of the UK, Continental Europe and the USA, presented by Jim Bryant, (c. 10,000 specimens)
- Middle-Upper Jurassic ammonites from the UK, France, Russia, Italy and Poland presented by John Wright (530 specimens)
- A skull of the pliosaurid *Simolestes vorax* from the Oxford Clay of Peterborough, Cambridgeshire presented by Scott Moore-Fay
- Three specimen of Volkovskite from Boulby mine, North Yorkshire presented by Chris Finch

Life Collections

A total of 28 accession lots of 6,357 specimens were received by donation to the collection.

Archive and Library Collections

43 academic and sector journals were purchased for the Library, 15 were donated (this includes 139 parts). In addition, 34 monographs were donated.

Professor Gillies McKenna donated a number of Vanity Fair caricatures including framed caricatures of Darwin, Huxley and Wilberforce.

Appendix 5: Loans

Earth Collections

31 loans of 337 specimens were provided, the majority of which were requested from the UK (280 specimens).

Life Collections

Total of 73 loans of 7,828 specimens were provided, which breaks down to 38 UK; 18 EU and 17 rest of the world respectively.

Archive and Library Collections

1 loans of 2 items was provided to the UK.

Appendix 6: Enquiries

Earth Collections

In total there were 567 enquiries to the team during the year.

Life Collections

Staff dealt with 633 enquiries requiring an estimated 617 hours of staff time.

Archive and Library Collections

There were 299 enquiries to the library and archive this year. Dealing with enquiries required an estimated 149 hours of staff time.

Appendix 7: Official Visitors

Earth Collections

There were 158 visitors, 141 from the UK, 4 from EEA countries and 13 from other countries (including 7 from the USA).

Life Collections

There were 236 visitors in total, 203 of which came from the UK, 6 from EEA countries and 27 from other countries.

Archive and Library Collections

The team welcomed 57 official visitors to the library and archives this year. The majority of visitors were from the UK (51).

Appendix 8: Publications on the Collections and by Museum staff

Museum staff and honorary associates indicated in bold.

Alamaru, A., Hoeksema, B.W., **van der Meij, S.E.T.** & Huchon, D. (2017). Molecular diversity of benthic ctenophores (Coeloplanidae). *Scientific Reports*, 7, 6365.

Brasier, A.T., Cotton, L.J., Garwood, R.J., Baker-Brian, J., **Howlett, E.** and Brasier, M.D. , 2017, Earliest Cretaceous cocoons or plant seed structures from the Wealden Group, Hastings, UK. In Brasier, A.T., McIlroy, D. and McLoughlin, N. (eds). *Earth System Evolution and Early Life: A Celebration of the Work of Martin Brasier. Geological Society Special Publications*, **448**, 440 pp.

Carnall, M. A. (2017). How to be more helpful to researchers. In The Museum Blog Book. Museums Etc. ISBN 978-1-910144-84-8.

Carvalho, F.L., **De Grave, S.** & Mantelatto, F.L. (2016). An integrative approach to the evolution of shrimps of the genus *Palaemon* (Decapoda, Palaemonidae). *Zoologica Scripta*, **46**, 473-485.

Cathrine, C. & **Longhorn, S.J.** (2017). Record of Phoneutria (Araneae: Ctenidae) from Inverbervie, Aberdeenshire. *Newsletter of the British Arachnological Society*, **139**, 13-15.

Cong, P., **Daley, A.C.**, Edgecombe, G.D., Hou, X. & Chen, A. (2016). Morphology of the radiodontan Lyrarapax from the early Cambrian Chengjiang biota. *Journal of Paleontology*, **90**, 663-671.

Cooter, J. (2017). Further records of *Thinobius newberyi* Scheerpleltz (Staphylinidae). *The Coleopterist* **26**(2), 114-115.

Crofts, S.B., **Neenan, J.M.**, Scheyer, T.M. & Summers, A.P. (2017). Tooth occlusal morphology in the durophagous marine reptiles, Placodontia (Reptilia: Sauropterygia). *Paleobiology*, **43**, 114-128.

Darroch, S.A.F., **Rahman, I.A.**, Gibson, B., Racicot, R.A. & Laflamme, M. (2017). Inference of facultative mobility in the enigmatic Ediacaran organism *Parvancorina*. *Biology Letters*, **13**, 20170033.

Davies, T.G., **Rahman, I.A.**, Lautenschlager, S., Cunningham, J.A., Asher, R.J., Barrett, P.M., Bates, K.T., Bengtson, S., Benson, R.B.J., Boyer, D.M., Braga, J., Bright, J.A., Claessens, L.P.A.M., Cox, P.G., Dong, X.-P., Evans, A.R., Falkingham, P.L., Friedman, M., Garwood, R.J. Goswami, A., Hutchinson, J.R., Jeffery, N.S., Johanson, Z., Lebrun, R., Martínez-Pérez, C., Marugán-Lobón, J., O'Higgins, P.M., Metscher, B., Orliac, M., Rowe, T.B., Rücklin, M., Sánchez-Villagra, M.R., Shubin, N.H., Smith, S.Y., Starck, J.M., Stringer, C., Summers, A.P., Sutton, M.D., Walsh, S.A., Weisbecker, V., Witmer, L.M., Wroe, S., Yin, Z., Rayfield, E.J. & Donoghue, P.C.J. (2017). Open data and digital morphology. *Proceedings of the Royal Society* B, **284**, 20170194.

De Grave, S. & Anker, A. (2017). An annotated checklist of marine caridean and stenopodidean shrimps (Malacostraca: Decapoda) of the Caribbean coast of Panama. *Nauplius*, **25**, e2017015.

De Grave, S., Anker, A., Dworschak, P.C., Clark, P.F. & Wirtz, P. (2017). An updated checklist of the marine Decapoda of Ascension Island, central Atlantic Ocean. *Journal of the Marine Biological Association of the United Kingdom*, **97**, 759-770.

De Grave, S., Anker, A., Pindar, C., Sandell, J. & Johnson, M.L. (2017). Eleven new records of caridean shrimps from Cuban waters (Decapoda, Caridea). *Crustaceana*, **90**, 617-624.

De Grave, S., Piscart, C. Tuekam Kayo, R.P. & Anker, A. (2017). A new groundwater-dwelling species of Euryrhynchina from Cameroon (Malacostraca, Decapoda, Euryrhynchidae). *Zootaxa*, **4254**, 120-126.

Drage, H. & **Daley, A.C.** (2016). Recognising moulting behaviour in trilobites by examining morphology, development and preservation: Comment on Błażejowski et al. 2015. *BioEssays*, **38**, 981-990.

Esteve, J., Rubio, P., Zamora, S. & **Rahman, I.A.** (2017). Modelling enrolment in Cambrian trilobites. *Palaeontology*, **60**, 423-432.

Falk, S.J., **Ismay, J.W.** & Chandler, P.J. (2016). A provisional assessment of the status of Acalyptratae flies in the UK. *Natural England Commissioned Reports*, **217**.

Gabriel, R. (2016). Some notes and observations on the breeding, care and social aspects of Heterothele gabonensis (Lucas, 1858) and Heterothele villosella Strand, 1907 (Araneae: Theraphosidae). *Journal of the British Tarantula Society*, **31**(3), 4-11.

Gabriel, R. (2017). The revised taxonomical status of Cyclosternum bicolour (Schiapelli & Gerschman, 1945 (Araneae: Theraphosidae). *Journal of the British Tarantula Society*, **32**(1), 10-12.

Gabriel, R. (2017). Some notes and observations on the breeding of *Cyriopagopus sp hati hati* (Araneae: Theraphosidae). *Journal of the British Tarantula Society*, **32**(1), 34-37.

Gale, A.S., **Kennedy, W.J.** and Martill, D. (2017). Mosasauroid predation on an ammonite – *Pseudaspidoceras* – from the early Turonian of south-eastern Morocco. *Acta Geologica Polonica*, **67**, 31-46.

Geffre, A. C., Liu, R., Manfredini, F., Beani, L., **Kathirithamby, J.**, Grozinger, C. M. & Toth, A. L. (2017). Transcriptomics of an extended phenotype: parasite manipulation of wasp social behaviour shifts expression of cast-related genes. *Proceedings of the Royal Society*, B **284**, 20170029. http://dx.doi.org/10/1098/repb.2017.0029.

Gorzelak, P., **Rahman, I.A.**, Zamora, S., Gąsiński, A., Trzciński, J., Brachaniec, T. & Salamon, M.A. (2017). Towards a better understanding of the origins of microlens arrays in Mesozoic

ophiuroids and asteroids. *Evolutionary Biology*, **44**, 339-346.

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Hoeksema, B.W., van Beusekom, M., ten Hove, H.A., Ivanenko, V.N., **van der Meij, S.E.T.** & van Moorsel, G.W.N.M. (2017). *Helioseris cucullata* as a host coral at St. Eustatius, Dutch Caribbean. *Marine Biodiversity*, **47**, 71-78.

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Hou, X.-G., Siveter, David J., **Siveter, Derek J.**, Aldridge, R.A., Cong, P.-Y., Gabbott, S.E., Ma, X.-Y., Purnell, M.A. and Williams, M. (2017). *The Cambrian fossils of Chengjiang, China. The flowering of early animal life.* 2nd edition. Wiley, Oxford, 308 pp.

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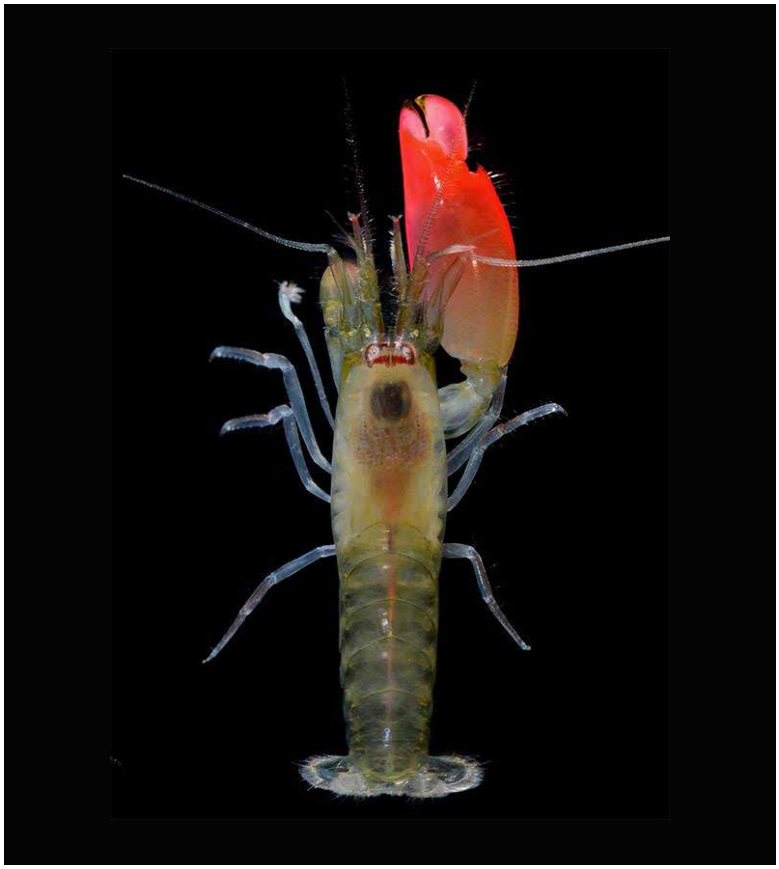

Front and back cover:
Synalpheus pinkfloydi male pistol shrimp, from the Las Perlas Archipelago, Gulf of Panama
Credit: Arthur Anker